SPATIAL AND STRUCTURAL PATTERNS OF MANUFACTURING INDUSTRY IN WEST MALAYSIA FROM 1957 - 1975: A CASE STUDY IN INDUSTRIAL GEOGRAPHY

Mahinder Santokh Singh

A thesis submitted for the degree of
Doctor of Philosophy

School of Oriental and African Studies,
University of London

September 1976

ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 – 1346

ABSTRACT

The theme of this thesis is an assessment of the impact of the manufacturing sector on the national and regional economies of West Malaysia and an evaluation of the factors determining the spatial and structural patterns of manufacturing at the macro- and micro-levels.

The industrial policy of the Government is viewed in the context of the economic problems confronting a newly independent nation characterised by an open dualistic economy. The district-level distribution and industrial structure that have emerged are evaluated. An analysis is made of the assumptions implicit in the plan for rapid industrial growth, that, spatially balanced development and an industrial structure conforming to the resource endowment can thereby be attained.

Subsequent industrial strategy with its well-defined social and economic priorities is examined. Since the spatial organization and behaviour of industry is partly the result of the individual firm's decision-making and response to industrial policy, the entrepreneurs' motives for investing in manufacturing and the selection of sites are analysed within the framework of location theory.

The industrial pattern that has resulted is evaluated. Changes in the industry-mix are noted. A centripetal pattern of industrial growth is revealed. The policy of achieving regional equality based on industrial decentralization is examined in the light of

the major factors that determine industrial location.

The hypothesis that equitable distribution of manufacturing industry involves the minimising of socio-economic differences between regions is tested at the district-level in a canonical correlation. A regional hierarchy is derived on the basis of socio-economic structure and acquired industrial assistance.

The relationship between industrial location and socio-economic structure is further examined in the analysis of commodity flow patterns. A dichotomous classification of commodity flows is derived. A system of regional and subregional production centres is revealed. Patterns of spatially mutual interactions and industrial linkages are derived from the analysis of commodity interflows.

Finally, alternative industrial policy measures and an industrial strategy based on an integrated system of regional growth centres are examined.

ACKNOWLEDGEMENTS

I would like to express my gratitude to Mr. R.W. Bradnock, my supervisor for his invaluable guidance and encouragement throughout the entire project. I am also very grateful to Dr. R. Ng, my co-supervisor for his assistance in computer work and statistical analysis.

Special thanks are due to my colleagues, Dr. Kamal Salih and Dr. Zia Haq whose assistance in computer techniques and constructive criticisms and guidance while on field-work in Malaysia were extremely useful. Assistance provided by Miss Khoo Yokekuan is noted with thanks.

I would also like to acknowledge with thanks all assistance and services rendered in the collection of data by the staffs of the State Development Corporations in West Malaysia, the Malaysian Industrial Development Finance Limited, the Federal Industrial Development Authority, Economic Planning Unit, the Department of Statistics and the Highway Planning Unit. In connection with the field interviews the assistance of Miss Lim Piao Li, Messrs Chong Sin Nin, Raj Armugam, Shim Kim Siang and Soloman of the various State Development Corporations and the cooperation of the managing directors of the manufacturing establishments, interviewed, is greatly appreciated.

I am grateful to the School of Oriental and African Studies for providing a financial grant for fieldwork in West Malaysia.

My appreciation is also extended towards the Staff of the Computer Centre of Universiti Sains, Malaysia and the Staff of the Computer Centre of University of London; Mr. Ahmad Endut for cartographic assistance; and Mrs. V. Williams for typing the thesis.

Last, but not least, for many reasons, besides those that are self-evident, I am the most indebted to my husband and children to whom this work is dedicated.

CONTENTS PAGE

Page

CHAPTER

33

LIST OF TABLES

35

37

39

Table | Page

40

LIST OF ILLUSTRATIONS

45

APPENDIX: LIST OF TABLES

CHAPTER I

INTRODUCTION: INDUSTRIAL LOCATION IN THE WEST MALAYSIAN CONTEXT

The main objectives of this study are

1. to analyse the spatial and structural patterns of manufacturing industry in West Malaysia from the time of independence to the present, with the intention of evaluating the impact of the sector on the national and regional economies against the social and economic objectives of the West Malaysian industrial policy;
2. to identify the major factors that determine the spatial distribution and structure of the manufacturing industry in West Malaysia.

The approach adopted in this thesis draws on theoretical and empirical contributions made to the study of industrial location.

1.1. Theoretical Aspects

Theoretical contributions to the study have been made mostly by economists rather than geographers and pre-date the First World War. But industrial location implies the existence of spatial relationships, interrelationships and patterns, so that, although industrial production is an economic activity, the field of study is by definition part of geography.[1]

---

1. Hamilton, F.E.I., 'Models of Industrial Location', in Models of Geography. Edited by Chorley, R.J. and Haggett, P. Part I and III, University paperbacks P. 361.

The earliest approach to the subject is usually traced to Alfred Weber[1] who sought to explain plant location by abstracting from demand and explaining it as a product of spatial cost differences. He derived what is termed the least-cost analysis.

The second approach is the locational inter-dependence or market approach. It attempted to seek a location at which revenue is greatest and attempted to portray a situation of equilibrium under conditions of imperfect competition by introducing variations in demand. It also attempted to analyse demand in a spatially distributed market instead of the punctiform market of the least-cost location.[2]

The third conceptual development in the 1950's in location theory was the development of the behavioural approach. It attempted to integrate least-cost and locational inter-dependence approaches. Greenhut, Pred and Hamilton are a few of the contributors. This approach attempted to analyse industrial location by emphasising the impact of inter-dependence between firms. Concepts of agglomeration or deglomeration were, thus, introduced. This approach also introduced a theoretical re-orientation to accommodate suboptimal behaviour, implying a need to relax the profit maximization assumption.[3]

---

1. Smith, D.M., Industrial Location. An Economic Geographical Analysis, John Wiley and Sons. P.113-119.

2. Hoover, E.M., The Location of Economic Activity, McGraw-Hill Economics Handbook Series, 1948.

3. Pred, A., Behaviour and Location: Foundations for a Geographical and Dynamic Location, Part I. Lund Series in Geography.

Personal considerations were introduced in the concept of maximum satisfaction in plant site selection.[1]

The behavioural approach also attempted to integrate location theory with other branches of economic activity. Walter Isard built up a body of theory and analytical tools to assist in the understanding of the operation of economic processes in the real world, drawing upon the concepts outlined above and integrating them with economics of localization and urbanization to explain agglomeration.[2]

A synthesis is achieved by incorporating earlier industrial location theory and central place theory.[3]

More recently, theoretical models have also been constructed to provide a basis for solving problems in industrial planning. In an attempt to provide a logical approach to location problems, industrial location phenomena have been set in the context of economic systems, political systems, settlement hierarchies and historical and technological backgrounds, be they regional, national or inter-nation.[4]

---

1. Greenhut, M., Plant Location in Theory and in Practice. University of North Carolina Press, Chapel Hill. 1956. P. 175-76; 282-83.

2. Isard, W., Location and Space-Economy. M.I.T. Press. 1956. P. 268-272.

3. Isard, W., Op.cit., P. 270-271, and Smith, D.M., Op.cit., P. 130-137.

4. Hamilton, F.E.I., Models of Industrial Location Op.cit., P. 361-424.

1.2 Different Forms of Empirical Studies

Despite the progress of industrial location theory from the abstract to concepts applicable to reality, a large proportion of empirical studies on the subject has been undertaken with the purpose of gaining a general understanding of locational factors, and patterns rather than for testing theoretical concepts. Although it is often claimed that an idiographic approach tends to dissipate rather than integrate the body of location theory and practice,[1] this criticism is unjustified. Before the recent development of conceptual models which relate industrial location to a spatial economy, it was difficult to generate testable hypotheses. The goals of the theoreticians have been quite different from the goals of the researcher interested in empirical work. In addition, problems of obtaining appropriate data were encountered. Identification for example, of a least-cost location for a particular industry required a large amount of accurate data, of a kind that could only be obtained by direct inquiry of existing firms.

Furthermore, finding the optimum location for one firm at one point in time is often of little help in explaining the areal distribution of a whole industry, which may be the end product of a long process of evolution and which contains firms of different size, technology and entrepreneurial skill.

---

1. Hamilton, F.E.I. Op. cit., P.360.

However, these criticisms do not negate the use of theory as a framework. Empirical investigations based on different theoretical concepts have taken various forms of analysis. These can be categorised into four main groups.

The first category of research studies consist of empirical identification of variations of single input cost surfaces[1] namely of labour, land, construction materials and taxes. Comparative locational advantages were measured directly in terms of a real variation in the cost of purchasing inputs or input. The main issue in these studies was how far the abstract concept of cost surface could be given empirical identity by applying theory to practical solutions. The limitations of these studies in explaining industrial patterns are obvious.

Another category of research studies is centred on the behaviour of a particular industry.[2] Analysis of comparative locational costs were concerned with comparative advantages of alternative sites with respect to inputs and demand. The theory of the firm was used to explain location patterns.

As a corollary to this group of studies is the analysis of the behaviour of individual firms or groups of firms under given assumptions in order to answer two

---

1. Examples of these studies are found in Smith, D.M., Industrial Location. Op.cit., P.279-295.

2. Theodore, Herman. Cultural Factors in the Location of the Swatow Lace and Needlework Industry. AAAG, Vol. 46, 1956. P. 122-128.
Hoover, E.M. Location Theory and the Shoe and Leather Industries, Harvard University Press, Cambridge. 1937.

questions: What to produce? and where to produce? Empirical regularities were used to construct theoretical models analysing location and production decisions. The problem these analysts faced, however, was how to proceed from the individual action to the general location patterns except under extremely simplified circumstances.

In keeping with the recent developments in theory is the fourth category of studies which is concerned, primarily, with the total observed pattern. Explanations are sought for the patterns of industrial action, not in isolation, but as phenomena inter-related with the spatial patterns of economic activity and land-use in general and other social and political forces.[1] This approach draws heavily from theoretical concepts and overcomes the criticisms of location theory as a "static construction".

1.3 Theoretically and Empirically Derived Framework of this Study

The approach adopted in this thesis illustrates three methods used in industrial geography, namely, the

---

1. Examples of this approach are: Leslie Dienes, Locational Factors and Locational Developments in The Soviet Chemical Industry. The University of Chicago, Department of Geography, Research Paper No. 119, 1969.

   Britton, J.N.H., 'Regional Analysis and Economic Geography', A case study of Manufacturing in the Bristol Region. Bell's Advanced Economic Geographies, 1967.

historical, regional and factor methods. This approach is most suited to the objectives outlined earlier. The first one, stresses the evolutionary aspects of the manufacturing sector. It examines the responses to the dynamic forces of political and economic changes and social aspirations. The second method involves the description of regional patterns. The regional industrial profile, which is likely to show regional contrasts, is also analysed. The cause and effect of the growth of the manufacturing sector can be related to the linkages within the diverse patterns of land-use, economic activity and resource endowment in each region and among regions. The third method examines the major factors which influence the location of individual firms, such as raw materials, energy, labour and markets. The importance of these factors is analysed from the entrepreneurs' own locational evaluation. It would have been appropriate to follow this analysis with comparative costs analysis of the major elements which constitute total costs, but lack of cost and price data imposed strict limitations on the use of this method in the study area.

To facilitate the use of both macro- and micro-levels of analysis, the firm is taken as the unit of study and the district is chosen as the unit area of study at the sub-national level.

The choice of the district rather than the State or the urban centres is guided by a number of considerations. Although data at the state level are readily available intra-state variations in land-use, socio-economic structure and level of manufacturing

would render such an analysis meaningless. Furthermore, in the past rigid compartmentalization,spatially, of rural and urban development schemes was pronounced. Planners have failed to regard the impact of such schemes as complementary or as holistic within the space economy. The two types of schemes have not been planned with common terms of reference. An analysis confined to urban centres would omit industrial growth in the rural-urban fringe areas; it would also isolate possible resource areas and markets from the production centres. Hence, to overcome these limitations, a district-level study is designed. It is the smallest unit area for which substantial data are available and it is hoped that at the district-level different aspects of development could be merged to provide an integrated regional approach in development planning.

Within this framework the study is organised as follows:

In the second chapter the industrial policy of the West Malaysian Government and the need to foster industrial growth are analysed in the context of the economic problems confronting a newly independent nation which has been dependent on two export-oriented primary commodities, rubber and tin.

The overall performance of the manufacturing sector and the district-level distribution and structure of the manufacturing sector that emerged at the end of the initial policy of free-enterprise are examined (Chapter 3). The notion of growth in the manufacturing sector is evaluated along two distinct lines, namely,

the growth of the sector vis-à-vis the other components of the national economy and the regional contribution and spatial distribution. In this chapter, too, the different ways of measuring growth performance of the manufacturing sector, without resorting to data - summarising techniques are examined. The weaknesses of single measures are also outlined.

In chapter four the weaknesses of the assumptions made in the initial national industrial policy are discussed. The assumed complementarity between rapid industrial growth and the growth of an industrial structure that would create adequate employment and achieve equity objectives are analysed. The new industrial strategy with well-defined social and economic objectives that followed the civil disturbances in the country is outlined in this chapter.

The success of the new industrial strategy rests, partly, on the ability to attract investments into the manufacturing sector. In chapter 5, using a micro-level approach, the motives for investing in manufacturing are analysed from the entrepreneurs' decision-taking. These findings are then compared with the measures adopted by the Government to motivate private investors.

In the same chapter, attention is focussed on the behaviour of the firm in understanding some of the processes of industrial location. A multi-factor classification is derived from empirical studies on the factors influencing plant location. The characteristics of a sample of industrial sites in West Malaysia are summarised

in terms of the industrialists' locational evaluation.

In chapter 6 the subsequent pattern and structure of industrial growth is analysed and evaluated against the objectives mentioned earlier. An attempt is also made to classify districts in terms of the level of manufacturing attained.

In chapter 7 explanations for the spatial variations in the growth of the manufacturing sector are sought in the socio-economic structure and the effects of industrial policy measures. Regionalization based on socio-economic structure and implemented industrial policy measures is attempted. The Government's objective is to achieve regional equality by decentralising industry. In this context the hypothesis is advanced that equitable distribution of manufacturing industry rests on the pre-requisite of minimising distances along the socio-economic scale. This hypothesis is tested in a canonical correlation in Chapter 7.

In chapter 8 functional interrelationships between regions are illustrated in the patterns of commodity flows. These relationships are analysed. National and regional subsystems are identified based on supply and demand patterns and the extent of market areas of different distribution and/or production centres. The relationships between out-flows and inflows of commodities are also evaluated in the context of regional complementarity.

Finally, based on the findings of the regional approach and that of the firm, changes in industrial policy measures are suggested to reconcile the social and

economic objectives of the Government with the factors determining industrial location.

The conclusions of this study are summarised in Chapter 9.

CHAPTER II

EVOLUTION OF THE MANUFACTURING SECTOR

2.1 Background to the Study Area

West Malaysia[1] or Peninsula Malaysia constitutes a total area of 50,700 square miles made up of eleven states which are further subdivided into seventy-one[2] administrative districts (Figure 2.1). The spatial distribution of the major towns and state capitals shown on the same figure displays a west coast bias resulting from historical precedent and the physical configuration of the country. Figure 2.2 shows that the mountainous backbone in the centre of the peninsula not only precludes settlement in the interior but it also isolates the coastal plains and the foothills of the east coast from those of the west coast. Thus a majority of the population is confined to the coastal plains and the foothills in the west.

West Malaysia's economic position at the time of independence in 1957 can be summarised as a classical case of "an open dualistic economy"[3] with heavy dependence on two commodities for export and reliance on imports

---

1. Prior to the formation of Malaysia in September 1963 it was known as the Federation of Malaya. These terms would be used interchangeably in the text.

2. In the 1957 Population Census reference is made to 71 districts. The district of Selama was merged with Larut and Matang in the 1970 Population Census. Hence, for purposes of comparability the adjustment is made from the start.

3. Paauw, D.S. and Fei, C.H., 'The Transition in Open Dualistic Economies, Theory and Southeast Asian Experience, New Haven and London, Yale University Press, 1973, p.10.

Fig: 2.1 MAJOR TOWNS, DISTRICTS AND STATES OF (WEST MALAYSIA) MALAYA. 1957

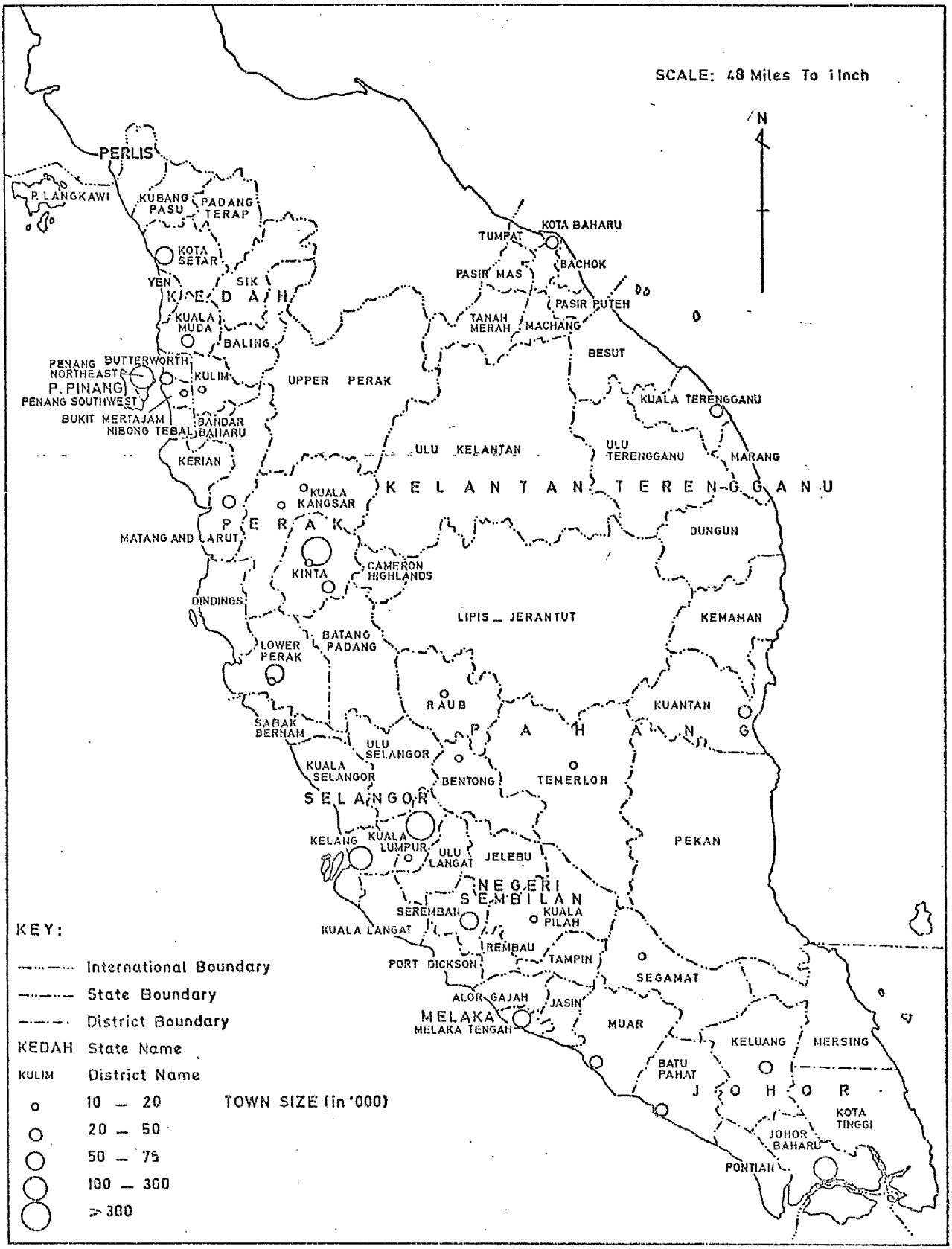
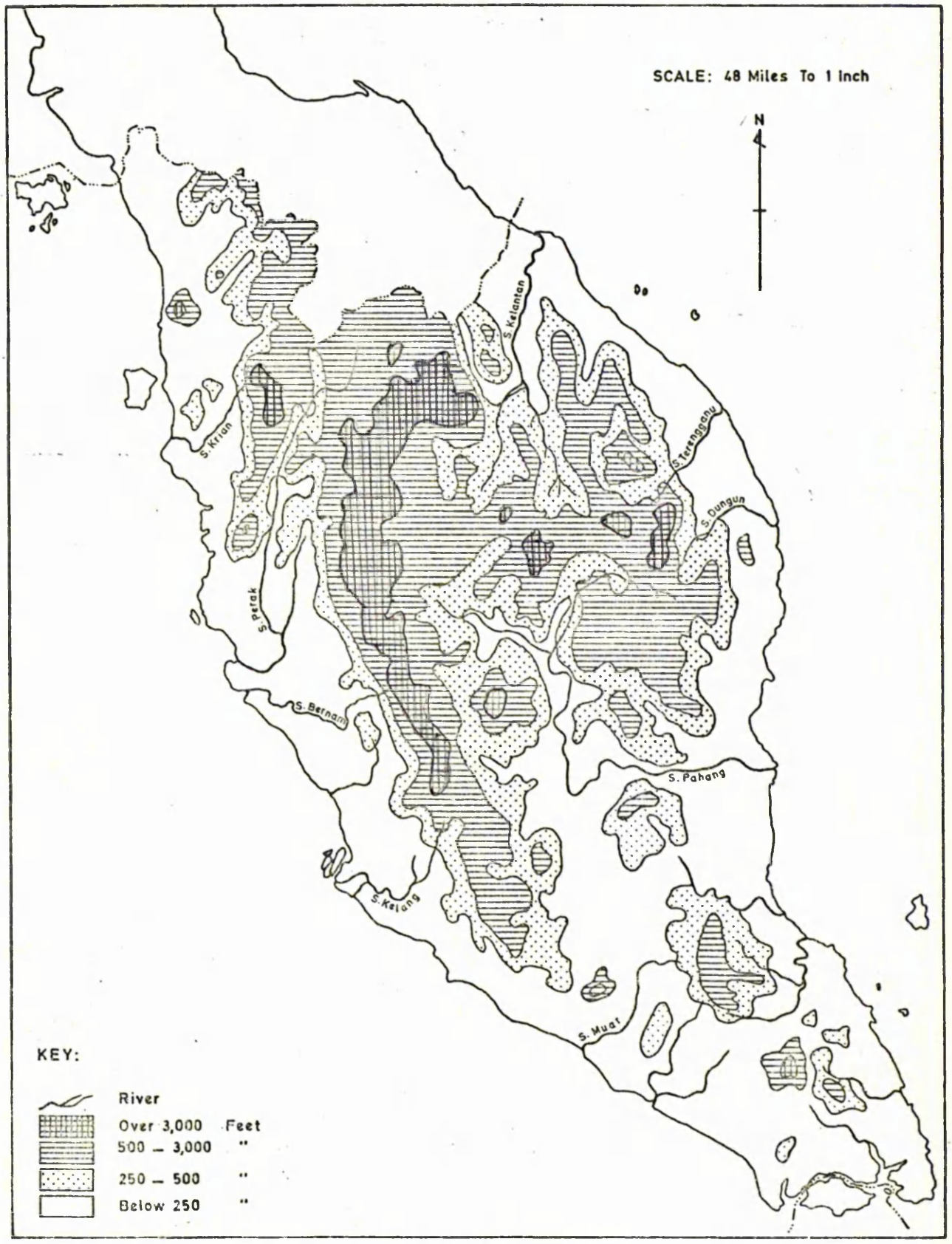


Fig: 2.2 WEST MALAYSIA: RELIEF AND DRAINAGE



for most of its manufactured goods and substantial portion of its food. The dominance of agriculture is discernible from its role in all major aspects of the economy, namely, the creation of employment, production for exports, contribution to savings, financing of imports, repatriation of profits abroad, and its contribution to gross domestic product.

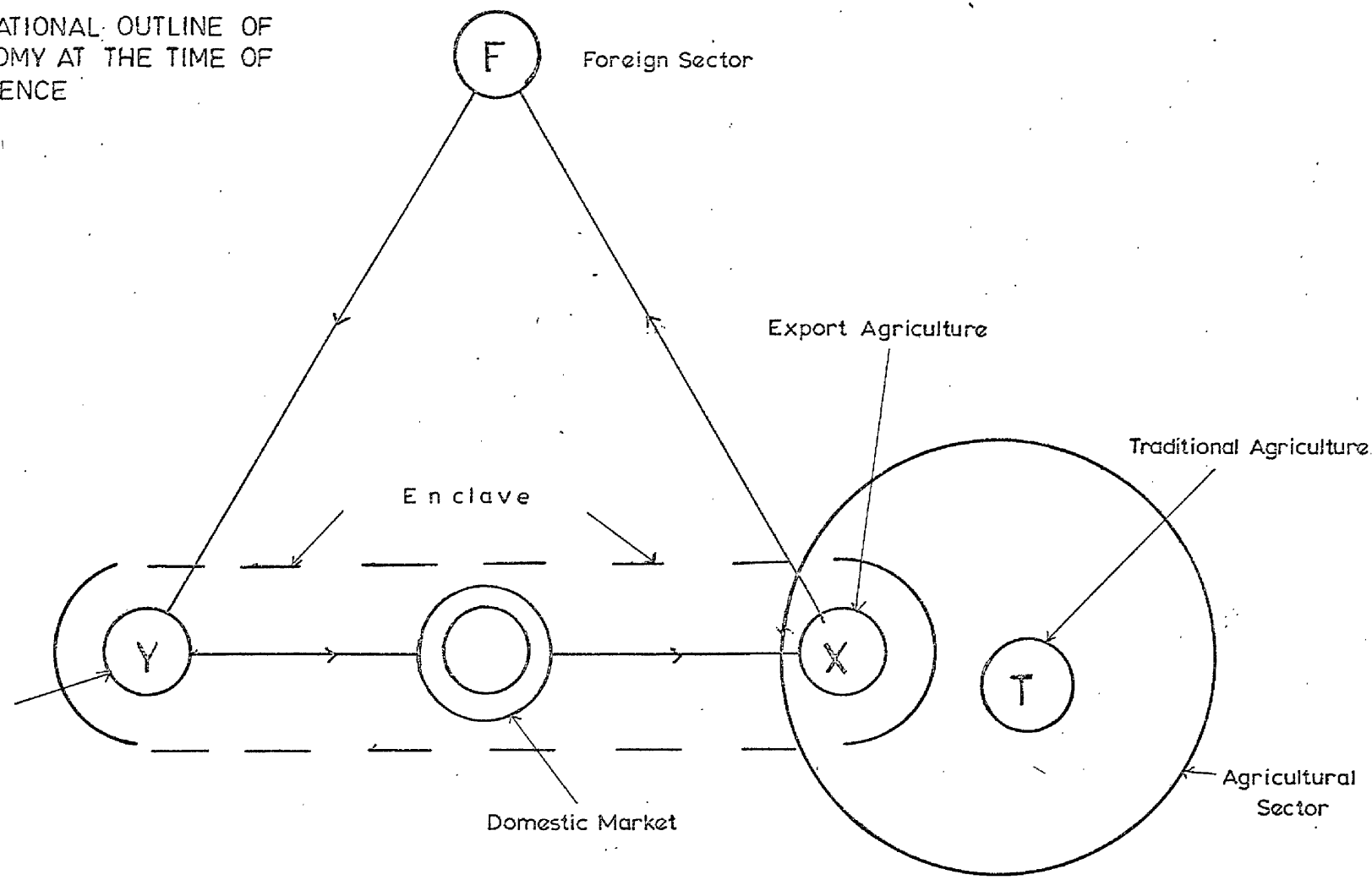
Within the agricultural sector dualism exists. One component is the commercialised agricultural sector dominated by foreign capital, and the other component is the traditional subsistence agricultural sector which is isolated and associated with under-employment, low productivity and rural poverty.[1]

Dualism also exists between the agricultural and the non-agricultural sectors which are linked by the foreign sector as shown in figure 2.3. Exports in the form of primary products flow from the commercialised agricultural sector to the foreign sector while the earnings finance the imports of the manufactured goods and foodstuffs from the foreign sector for the non-agricultural sector. As a direct link the non-agricultural sector supplies goods and services to the commercialised agricultural sector. These goods include items such as fertilizers and engineering products. Service facilities include repairs and servicing of factory equipment used in agricultural processing. Together these two sectors comprise the modern enclave.

---

1. Ibid., p.16.

Fig. 2·3 THE OPERATIONAL OUTLINE OF THE ECONOMY AT THE TIME OF INDEPENDENCE



Source: Extracted from Paauw& Fei op. cit., P. 4.

On the basis of such an operational system it is not surprising that half of the country's labour force in 1957 was engaged in primary production (Table 2.1). However, only one-quarter of the labour force was involved in food production, mainly wet rice cultivation at subsistence level. The dominant crop was rubber which was grown on plantations and smallholdings. The former was controlled by foreign enterprise while the latter was locally-owned. A very small acreage was devoted to oil palm, coconut and pineapple cultivation.

The primary sector, namely commercial agriculture and mining produced more than two-thirds of the gross domestic product (Table 2.2) and rubber and tin, combined, accounted for over 80 percent of the net export earnings. In direct contrast, the food producing agricultural sector could not meet the country's requirements even in the staple item of its diet, namely, rice. This is clear from the list of imports (Table 2.3); and imports of foodstuffs, as a consequence, constituted a third of the value of imports.

Thus, the economy was faced with the problem of extreme dependence on two export items, and after independence measures to get away from the colonial pattern of the economy was the first priority.

2.2 The Case for Industrialization

It cannot be disputed that West Malaysia's function as the world's largest producer and exporter of two main primary raw materials, rubber and tin, brought

Table 2.1 SECTORAL CONTRIBUTION TO EMPLOYMENT, 1957

Industry	Total (000)	Percent
Agriculture, Forestry, Hunting & Fishing	572.8	26.94
Agricultural products requiring substantial processing	672.0	31.61
Mining & Quarrying	58.5	2.75
Manufacturing	135.4	6.37
Construction	68.1	3.20
Electricity, Gas, Water & Sanitary Services	11.5	0.54
Commerce	195.2	9.18
Transportation, Storage & Communications	74.8	3.52
Services	319.7	15.04
Industry not specified	18.1	0.85
Total	2126.1	100.00

Source: Population Census Report 1957

Table 2:2 CONTRIBUTION OF VARIOUS SECTORS TO GROSS DOMESTIC PRODUCT (PERCENTAGE)

Composition	1955	1956	1957
1. Agriculture, Forestry, Hunting & Fishing	41.4	37.8	36.8
2. Mining & Quarrying	5.9	6.8	6.5
3. Industry	12.5	12.6	12.6
i) Manufacturing	8.9	8.6	8.4
ii) Construction	2.3	2.6	2.7
iii) Power	1.3	1.4	1.5
4. Services	40.0	42.8	44.0
i) Transport & Communications	3.0	3.3	3.4
ii) Other Services	37.0	39.5	40.6
Total	100.0	100.0	100.0
Gross Domestic Product $m (million) (Market Price)	4992	5060	5126

Source: Compiled from the National Accounts of the States of Malaya

Table 2:3 NET EXPORTS AND NET IMPORTS 1957

Net Exports	Percent
Rubber	68.7
Tin	19.4
Iron Ore	3.6
Palm Oil & Kernals	2.7
Copra & Coconut Oil	1.9
Canned Pineapples	1.1
Sawn timber	1.6
Others	1.0
Total	100.0

Net Imports	Percent
Rice	9.3
Other Foods	20.8
Drinks & Tobacco	6.1
Petroleum Products	9.0
Textile Manufacturers	6.7
Machine & Machine Products	8.7
Transport Equipment	6.0
Metal Manufactures	4.0
Chemicals	6.7
Other Manufactures & Other Materials	22.7
Total	100.0

Source: W.M. Corden and H.V. Richter, Malayan Trade Statistics - Entreport Trade in T.H. Silcock & E.M. Fisk (ed.) The Political Economy of Independent Malaya P. 296.

her some advantages. "By Asian standards the West Malaysian economy had reached a relatively advanced stage in the level of per capita income,"[1] which amounted to U.S. $250 in 1957. Based on a relatively prosperous primary producing economy the country had also become accustomed to a high standard of living with easy imports of a wide range of manufactured goods as reflected in the list of imports in table 2.3. But it is important to stress here, that, although the market for manufactured goods was created, production of these goods locally was limited to a very narrow range of consumer goods, handicrafts and ancillary industries which sprang up with and were dependent upon the primary industries of agriculture and mining. Cottage industries were concerned with the production of small quantities of hand-made consumption goods in everyday use. These were a part of the Malay self-subsistence economy, the products of these industries going towards satisfying the meagre needs of the local kampong (village) population, but these industries have never been important in the industrial economy of the country.[2]

The cause for industrial backwardness lay in the "international division of labour which made the country economically dependent upon the industrially developed ..... countries, and turned it into a buyer

---

1. International Bank for Reconstruction and Development (I.B.R.D.), 'Report on Economic Development of Malaya', John Hopkin Press, Baltimore, 1955. p. 20.

2. Ooi Jin Bee, Land, People and Economy in Malaya. Longmans, 1963. p.319.

of industrial goods and a supplier of raw materials."[1] In fact, the policy of comparative advantage in primary production was carried to its extreme by maintaining a condition of laissez-faire. Complete absence of effective protective measures led to the decline in importance and disappearance of cottage industry when factory-made manufactured goods began to flood the market. Only the batek and local luxury industry (silver and gold works) remained but continued production at a very small scale.[2]

Import duties that existed before independence were based on a system of preferential rates for imports from Britain and the Commonwealth to protect their imports against competitive goods from the non-Commonwealth countries. Ridzuan states that in a large number of cases goods from the Commonwealth territories entered free of tax. For non-Commonwealth imports, the ad valorem rate varied from 10 percent to 25 percent.[3] This aim of protection was differentiated from the second function of revenue collection which was achieved by imposing tariffs on a few commodities such as liquor, tobacco, textiles, petroleum and sugar.

---

1. Cukor, G., Strategies of Industrialization in the Developing Countries, translated by C. Hurst and Company. 1974. p.7.

2. Ooi Jin Bin, Op.cit., p. 323.

3. Ridznan bin Akil, "Growth, Structural Change and Employment Creation in the Malayan Manufacturing Industries since Independence." An unpublished Ph.D. thesis, University of Hull, 1972. p. 17.

In the absence of any inducement for fostering the growth of manufacturing industry, the contribution of the industrial sector (including manufacturing, building and construction) to the gross domestic product was a meagre 12.3 percent while the export sector contributed 50.6 per cent to G.D.P., one of the highest among developing countries with a similar economic structure.

Alongside this over-dependence on primary commodities is the erosive effect of outflows in the form of imports accounting for a third of the gross national product.

From the economic point of view specialization in just two primary export products has the resultant effect that the domestic economy is vulnerable to the unstable nature of the world market. The deterioration of the terms of trade of primary agricultural products relative to manufactured goods and the fluctuations in the prices[1] of these land-based commodities means that development is impeded. In addition, planning for long term development under the circumstances, when producing countries have no control over the quotation of prices of primary export commodities, is almost impossible. Hence, structural transformation of the economy seems a prerequisite for balanced and self-sustained growth. The timing for the necessary transformation seems to be

---

1. Lo Sum Yee, The Development Performance of West Malaysia, Heinemann Educational Books (Asia) Ltd., 1972 P. 3 and 4.

most appropriate after independence, when the objectives of the governing body are narrowly and precisely allied with the interests of the nation. From the political and social point of view, too, the isolated and poverty-stricken traditional agricultural sector cannot be further ignored.

The need to introduce modern technology into the country has been another reason for a policy of encouraging industrialization. Cukor argues that it is easier to introduce modern technological methods in industry than in agriculture because from the technical viewpoint, the circumstances of industrial production, on the whole are very similar in developing countries to those in industrial countries and having trained the labour, and given the required infrastructure, similar techniques can be employed in the developing countries as those developed in the industrial countries.[1] Such a direct transfer of technology has not been possible in agriculture due to differences in climate, soil structure and other environmental factors, not to mention differences in the crops produced.

Supported by the above arguments for a structural change in the economy, planners looked upon industrialization together with agricultural diversification as solutions for the weaknesses in the economy.

---

1. Cukor, G., Op.cit., p.51.

2.3 Government Policy and Measures to Promote Industrial Development

Independence marked the beginnings of a policy in which industrialization together with agriculture were spelt out as the main sectors to spearhead economic progress. But the approach adopted to speed up economic development was not new in the West Malaysian context, nor was it as vigorous as that adopted by the other emerging countries of Asia and Africa. Paauw and Fei refer to it as neocolonialism,[1] that is, a policy still couched in the open dualistic structure of the colonial economy. According to this policy, the natural resource endowment and the growth potential in the primary exports were still expected to be the main sources of revenue for financing economic growth. But within this "old order" radical changes were brought in: first, diversification within the agricultural sector was introduced by emphasising (new) crops with an export potential. New is placed in parenthesis as these crops were not new in the strict sense. However, although they were cultivated in the past this was only on an extremely small scale. The novelty of the independence approach was to cultivate them extensively as significant export items. Rural development was greatly emphasised so as to modernise the traditional agricultural sector.

---

1. Paauw, D.S. and Fei, C.H. Op.cit., p.12.

Apart from diversification within the agricultural sector, diversification measures within the economy were outlined by stressing the growth of the industrial sector.

The policy of industrialization was based on the principle that the Government would maintain conditions of free enterprise and laissez-faire.

This approach originated from the "outward looking" ideology on which her past development rested when she exported primary raw materials produced by private entrepreneurs and imported manufactured goods from the Commonwealth countries. Although investment in manufacturing embodied both public and private investment, the role of the public sector was restricted to providing the necessary infrastructure and a suitable climate for industrial growth. The success of the policy so outlined, thus, rested with the initiative of both domestic and foreign private entrepreneurs.

This industrial strategy which outlined a passive role for the government was based on earlier recommendations on industrial development embodied in the report on the "Economic Development of Malaya" made in 1955 by the International Bank for Reconstruction and Development (I.B.R.D.).

The I.B.R.D. conceived the role of Government in relation to manufacturing enterprise as twofold:-

1) To provide adequate basic services, electrical power water supplies, transport and communication, ...

2) To foster individual enterprise and to create a favourable climate for its development, through .....

measures already undertaken.[1]

In particular it made seven specific recommendations:-

"a) establishment of technological and market research services for secondary industries;

b) emphasis on industrial and vocational needs in educational and training programmes;

c) active steps to interest overseas firms in Malayan industrial projects where their technical know-how may be important;

d) improvement of facilities for the financing of sound industrial projects;

e) close attention to the economic situation of secondary industries in determining fiscal, monetary and other polices;

f) extension of official services to assist in the acquisition of factory sites and to help new enterprises overcome other initial problems; and

g) use, in the Federation, of the tariff as a means of encouraging development, not to shelter inefficient or hopelessly high-cost industries but as an impetus to enterprises otherwise very near or only just over the margin of profitability or initially handicapped by temporary obstacles."[2]

---

1. I.B.R.D., Op.cit., p. 122.

2. I.B.R.D., Op.cit., p. 123.

On the question of protective measures the Mission favoured tariff protection and general concessions such as depreciation allowances as suitable and effective tools for encouraging the following industries:

"Industries that have reasonable expectations ..... of selling at prices little above those of foreign competitors and within a few years of reducing costs sufficiently to compete without protection, because of their own growth ..... or because of gradual improvement in operating conditions .....

Where local manufacturers can produce an equivalent article at a price competitive with imports but where protection is necessary to prevent the splitting of the market .....; .... give the local manufacturer an opportunity to overcome a superficial preference for the familiar imported product .....; Where protection may be an important inducement to the establishment in Malaya of a foreign-owned industry" and overcome "its reluctance to make the investment if it may have to share the market with imports," and where "protected domestic market would ..... provide a safe 'home-base' from which to venture into unprotected markets further afield ..... in ..... external markets."[1]

However the Mission was not in favour of creating 'pioneer industries', that is, industries exempted from income tax through special concessions.

---

1. I.B.R.D., Ibid., p. 124 and 125.

The policy of industrialization in several developing countries was based on the policy of 'pioneer industry'; but the Mission was opposed to it because it believed that new industries "should mostly grow out of the wide range of existing enterprises, and special income tax concessions to 'new' industries would ..... involve invidious comparisons of a very difficult and unnecessary kind."[1]

Lastly, it also recommended the establishment of a Division of Industrial Development for reviewing protective measures, safeguarding against abuse of protection and for implementing recommendations, outlined above.

These broad principles of industrial policy were incorporated into a white paper Number 30 of 1957 and tabled in Parliament as the Industrial Development Working Party Report. The recommendations of the Working Party Report differed from the I.B.R.D. recommendations in two respects:[2] First, it recommended some inducement to foreign and local capital by allowing free transfer of capital and earnings and guaranteed against nationalization; Secondly, it favoured introduction of pioneer industry legislation as an inducement to domestic and/or foreign capital investors to initiate industrial activity

---

1. I.B.R.D., op.cit., p.436 and 437.

2. Federation of Malaya, Industrial Development Working Party Report, Government Printers, 1957. p.37.

which they would not otherwise undertake, and to induce an increase in investment in existing enterprises.

As a consequence, the Government adopted the Report of the Industrial Development Working Party in~~to~~ and industrialization became part of national policy. To implement the policy, Government established an Industrial Development Division within the Ministry of Commerce and Industry as a liaison body between the Government and prospective industrialists.

It can be concluded from the above that Government's attitude towards industrial development was one in which she favoured for herself a role of indirect participation by providing incentives to both local and foreign capital and a secure 'climate' for industrialization. The 'climate' referred to was described succinctly in the Second Malayan Plan:

"Perhaps the best contribution Government can make to industrial development is the preservation of a sound and stable monetary and financial climate, free from all restrictions, controls, uncertainties which are inevitable accompaniments of financial instability and inflation."[1]

The role of indirect participation also found expression through a number of measures:-

a) public expenditure on social and economic infrastructure to provide a suitable climate for growth.
b) Fiscal and tax incentives.
c) Protective Tariffs

---

1. Lo Sum Yee, Op.cit., p.78.

d) Creation of industrial estates.

e) Industrial Research and training facilities.

Under the first measure efforts were made to provide public utility services such as electricity, water supply, transport and other overhead facilities. In the First Malayan Plan 1956-60 a total expenditure of $148 million was outlined for electricity, $80.6 million on water supply, $16 million on sewerage and $206.4 million on transport.[1] Lo Sum Yee estimates that the total amounted to 44 percent[2] of the total allocated but the actual expenditure was ten percent higher amounting to 52 percent of the estimated public development expenditure. By 1960 capital expenditure accounted for 16 percent of the G.N.P. Spending on infra-structure constituted half the total public expenditure in the next five year plan. This figure testifies to the tremendous amount of money that has been poured through the public sector to create an attractive environment for industry.

Fiscal and tax incentives were introduced to encourage foreign investment so as to overcome any scarcity of capital and to reinforce local capital. The Pioneer Industry (Relief from Income Tax) Ordinance was passed in 1958. Under this Ordinance pioneer status is granted to a company which can satisfy the Ministry of Commerce and Industry that:

---

1. Federation of Malaya, First Five-Year Plan, 1956-60, Government Printers, Juala Lumpur. 1955.

2. Lo Sum Yee, op.cit., p.78, 79.

1) the industry is not being carried out on a commercial scale suitable to the economic requirements or development of Malaya.
2) That it is expedient in the public interest to encourage its development or establishment.[1]

According to this Ordinance, manufacturing establishments which are granted pioneer status received relief from the prevailing 40 percent company tax for a period of two to five years depending on the amount of fixed capital invested (see Table 2.4).

Table 2.4 RELATIONSHIP BETWEEN PERIOD OF TAX EXEMPTION AND QUALIFYING VALUES (IN TERMS OF FIXED CAPITAL INVESTED) UNDER THE 1958 PIONEER INDUSTRY ORDINANCE

No. of Years of Exemption	Fixed Capital Invested
2	$100,000
3	100,000-250,000
5	Over $250,000

Note: Money value is in Malaysian currency.

Source: 1958 Pioneer Industries (Relief from Income Tax) Ordinance.

Another measure adopted to improve industrial financing was the setting up of the Malaysian Industrial Development Finance Board (MIDF). It is a public company incorporated in 1960 to supplement the financing of the

---

1. Federation of Malaya, Pioneer Status Ordinance 1959.

manufacturing sector which then had depended mainly on the loans and advances made by commercial banks. It is sponsored by the Government, the exchange banks, Malayan Development Limited, Commonwealth Development Finance Company and insurance interests in Malaysia and the United States. MIDF offers long and medium term capital that cannot be raised from the usual commercial bank sources, equity, preference or debenture participation and underwriting and advisory facilities.

Private industrialists can apply for MIDF loans to cover part of the costs of land, factory buildings and machinery needed for their projects. To assist in the financing of machinery, MIDF operates a hire-purchase scheme.

Although the construction of the factories was left to the industrialists themselves, facilities exist within the Malaysian Industrial Estates Limited (MIEL) to assist small and medium industries to acquire factories on credit terms. This body is a subsidiary of MIDF, instituted to assist small industries.

Another institution for providing industrial credit is the Council of Trust for Indigenous People (Majlis Amanah Ra'ayat or MARA for short). It is a statutary body set up in 1965 and it began operating the next year with an allocated capital of $70 million. It assists Malay participation in industry and in business. It also provides financial assistance to industry and commerce where Malays are a partner or where MARA participates as a partner. By 1967 MARA had granted loans

valuing $4.7 million to industry and $13.9 million as investment in equity, training programmes and transport activity.

In 1967 the MARA unit Trust Limited (Mutual Fund) was incorporated as a subsidiary with an initial working capital of $2 million. This subsidiary body takes up shares allocated to Malays or purchases shares in the open market. It operates as a mutual fund, selling its own shares to the Malay public and undertaking to buy them back at market value at any time.

Contributory to the establishment of industrial credit institutions, the Government also gave guarantees regarding the security of foreign capital. Foreign enterprises are offered the same incentives as local industries. As a corollary to the "favourable investment climate", Government guarantees security by undertaking to pay fair compensation in the event of nationalization of any private property. There was complete freedom of transfer of capital and profits in the former sterling area but capital transactions in the non-sterling area were subject to certain exchange control regulations which were minimal. The Government also signed investment guarantee agreements with the United States and West Germany, to enlarge the source area of foreign investments. Double taxation agreements have also been made with the United Kingdom, Singapore, Japan, Hong Kong, Denmark, Norway and Sweden.

The Development of Industrial Estates is also part of the Government strategy to accelerate industrial development. One of the aims of industrial estates is

to provide sites for prospective industrialists for the location of factories. This is by and large the only measure which seems to affect the spatial distribution of factories although it has to be made clear that the sites of the industrial estates were in no way governed by social considerations in the preliminary stages. The development of the industrial estates was motivated with the aims of meeting basic infrastructural requirements of manufacturing firms. Land was leased to the industrialists for periods up to ninety-nine years although land remains, legally, a state property.

The first industrial estate was set up in Petaling Jaya, followed by a second at Mak Mandin in the state of Penang.

In addition to the wide range of measures discussed above, protection for industry in the form of tariffs was also introduced. The Customs (Dumping and Subsidies) Ordinance 1959 was a measure introduced to protect industry against unfair competition. The legislation provides for the imposition of anti-dumping and countervailing duties (in addition to normal import duties) on dumped or subsidised goods, if their import is likely to endanger an established industry or retard the establishment of an industry in the country.[1]

Although the use of tariff protection as a device for industrial promotion began soon after independence with the removal of the Commonwealth Preferences in 1959, tariff protection was used sparingly. The almost

---

1. Lo Sum Yee, Op.cit., p. 85.

complete absence of protection for local manufacturing industries may be considered unique when compared with the situation in other developing countries,[1] especially Latin American countries or even the situation in developed countries in the 1950's.

In West Malaysia there are variations in effective rates of protection among industries and even among products within one industry, largely because tariff policy has been implemented on an ad hoc basis at the request of domestic manufacturers. The Tariff Advisory Board (TAB) was established in 1964 on the recommendations of the Rueff Mission. Its main function is to advise the government on the imposition of protective tariffs. But by and large the aim of the government was to expand the manufacturing sector while maintaining the traditional free enterprise economy. Low tariff barriers have been favoured in order to enable industry to expand into the export sector. The outward looking policy that governed the stand on tariffs is expressed in the following statement;

"it is not the intention of the Government to support indefinitely firms which have little or no prospects of becoming viable in the absence of artificial isolation from foreign competition."[2]

---

1. Bela Balassa, 'Growth Strategies in Semi-Industrial Countries', Quarterly Journal of Economics. Feb. 1970. No. 1. P. 28.

2. Malaysia, First Malaysia Plan, 1965-70, Government Printers, Kuala Lumpur, 1965. P. 134.

The Government also concluded that it had no intention of restricting imports which explains why tariffs have remained low.

Provision of industrial research facilities to improve the methods of production of local industries is yet another measure adopted in industrial promotion. A sum of $5 million was allotted in the First Malaysia Plan for the establishment of a National Institute of Scientific and Industrial Research (NISIR) to provide all industrial enterprises with scientific and technical support. It is also equipped to study problems associated with industrial processing of locally available raw materials. In addition to NISIR, the Standards Institute of Malaysia (SIM) was set up to advise industries on standards of production. It functions as a body for quality control.

Lastly, the Government argued that any programme of industrialization required a labour force trained to meet industrial requirements. This important element brings to the fore-front the measures taken to restructure the education system to meet the man-power requirements for the operation of modern industry. It started in 1961 when $277.4 million of public expenditure was allocated towards education and training.

Universal free primary education was introduced in that year in West Malaysia, followed by the introduction of comprehensive education. To ensure that vocational, technical and scientific facilities are available, in 1969, with the assistance of World Bank, agricultural, vocational and technical schools were

established. In addition, two Industrial Training Institutes, one in Kuala Lumpur and a second in Penang were set up to provide training tailored to specific industrial skills.

The aim is to indicate movement away from the literary towards an education with a technical bias.

For purposes of administrative co-ordination the Federal Industrial Development Authority (FIDA) was set up in 1967. It was also vested with the powers of implementing all the promotional measures outlined, with the assistance of the Ministry of Commerce and Industry.

This summarises briefly the promotional measures based on the free enterprise strategy of industrialization. In the next chapter an attempt is made to evaluate the success of the policies by studying the changing pattern of industrial activity.

CHAPTER III

THE INITIAL PHASE OF INDUSTRIAL DEVELOPMENT 1957-1958

3.1 Definitions

It is appropriate here to define the term 'manufacturing' as applied in the Malaysian context. The definition of manufacturing as used in the West Malaysian Census of Manufacturing Industries followed that of the International Standard Industrial Classification (ISIC) of all economic activities published in 1958 by the Statistical Office of the United Nations.

"Manufacturing is defined as the mechanical or chemical transformation of inorganic or organic substances into new products whether the work is performed by power-driven mechines or by hand, whether it is done in the factory or in the worker's home, and whether the products are sold at wholesale or retail. The assembly of the component parts of manufactured products is considered manufacturing except in cases where the activity is appropriately classified under construction. Establishments primarily engaged in repair works are included, and classified according to the type of product repaired."[1]

---

1. West Malaysia, Department of Statistics, Census of Manufacturing Industries West Malaysia, 1968. p. 10.

Unlike the ISIC and that of the West Malaysian Census, the National Accounts include all processing of agricultural commodities under the term manufacturing. Thus, in all the National Accounts estimates of domestic product by industrial origin, oil palm fruit processing which is undertaken largely on estates is included under 'chemicals'. Rubber milling and processing which is performed, both on and off estates and smallholdings is given a separate heading within manufacturing and it is not grouped together under 'rubber products'. Conversely, in the census and the ISIC only that part of rubber processing and milling done off estates or holdings is included under manufacturing. It is given a separate heading as 'processing of estate-type agricultural products in factories off estates.' This activity includes tea factories off estates, coffee bean hulling off estates, rubber remilling and latex processing off estates, rubber smoke houses off estates, and crude coconut oil mills off estates and copra kilns off estates. Similar activities performed on estates are classified as agricultural activity.

The reporting or statistical unit adopted in this thesis, as in the Census, is the 'establishment', conforming to the United nations definition of an establishment as 'a single economic unit which engages under a single ownership or control, that is, under a single legal entity, in one, or predominantly one kind of economic activity at a single physical location.'[1]

---

1. Census of Manufacturing Industries, Op.cit., p. 10.

This definition is specially useful in a geographical analysis, where industry breakdown and spatial distribution is an important aspect of the study.

The Industrial classification adopted in this research is taken from the census. It is the Malaysian Industrial Classification (MIC) which generally follows the ISIC. In it 'industry' is defined as a group of economic establishments all of which are primarily engaged in the same kind of activity or in producing the same kind of products. The four levels of the MIC are discussed in Appendix A3.1. In this thesis the individual industrial activities of which one hundred and seventy-nine different types were known to exist in 1968 are grouped into five main categories according to the nature of the products and processes. These are elaborated upon in the Appendix A3.2. These five groups are termed: elementary resource-based industry, advanced resource-based industry, consumer non-durable industry, intermediate industry and capital goods industry.

Having defined the term manufacturing as it would be applied throughout this thesis, an attempt is made to evaluate the changes that have occurred in the manufacturing sector since independence, at the national and regional levels.

3.2 The Growth Performance of the Manufacturing Sector 1957 to 1968

In 1957 the industrial sector as a whole accounted for 12.5 percent of the Gross Domestic Product

(GDP) at current prices. The share of the manufacturing sector was 8.4 percent. The most dominant contributors to GDP were services and agriculture.

The very insignificant contribution of the manufacturing sector as referred to earlier was a reflection of the dominance of export-oriented agricultural economy, a feature characteristic of most developing countries. But what was most noticeable was that until 1960 the position of the manufacturing sector remained almost unchanged, as shown in Table 3.1. This situation existed despite the acclaimed policy of industrialization.

Generally among most newly independent countries a progressive increase in the share of manufacturing has been observed arising from an improvement in the per capita income which in turn stimulated a change in demand in favour of non-foodstuffs, thus, creating a market which enabled import-substitution of a wide range of commodities to replace imports.[1]

In West Malaysia, contrary to this trend, the increase in the share of manufacturing until 1960 was least spectacular although the institutional and attitudinal factors[2] conducive to the growth of modern industries existed, especially in the west coast States.

---

1. Arguments for import-substitution have been summarised by P.B. Clark in Clark, P.B., Planning Import Substitution, North-Holland Publishing Company Amsterdam. London 1970 P. 20-25.

2. I.B.R.D., 'Report on Economic Development of Malaya, John Hopkin Press, Baltimore, 1955 P. 20.

Table 3.1 PERCENTAGE SHARE OF MAJOR SECTORS TO GROSS DOMESTIC PRODUCTS FROM 1957 TO 1960

Major Sectors	1957	1958	1959	1960
Agriculture, Forestry, Hunting & Fishing	36.8	36.8	39.0	37.8
Mining & Quarrying	6.5	4.6	4.6	5.9
Manufacturing	8.4	8.7	9.0	8.7
Construction	2.7	2.7	2.6	3.0
Electricity, Water, Sanitary Services	1.5	1.3	1.2	1.3
All Other Services	44.1	46.0	43.6	43.3

Source: National Accounts

These were reinforced by infra-structural facilities in the form of power, communications and other basic facilities.

In addition to the slow growth, by international comparison, the performance of the manufacturing sector in West Malaysia was much slower than that of a sample of other countries, namely, countries with a similar economic structure, as the list compiled by Chenery and Taylor,[1] shown in Table 3.2, illustrates.

As an *a priori* hypothesis slow growth of the manufacturing sector could be attributed to

a) small size of the market which could be measured in terms of population and per capita income,

b) availability of resources,

c) the country's policies governing economic development,

d) entrepreneurial skills.

With reference to the achievements of other countries, smallness of the market cannot be justified as an explanation for the slow growth of the manufacturing sector in West Malaysia. The Table 3.2 shows that Iraq, for example, surpassed the West Malaysian performance although it had approximately the same population size and a slightly lower per capita income. Even Jamaica

---

1. Chenery, H.B. and Taylor, L., 'Development Patterns: Among Countries and Over Time', Review of Economics and Statistics, Vol. 50, No. 4, Nov. 1968. Table 11.

Table 3.2 PERFORMANCE OF THE INDUSTRIAL SECTOR IN SOME DEVELOPING COUNTRIES, CLASSIFIED AS SMALL-PRIMARY EXPORT-ORIENTED COUNTRIES

Country	Percapita Income US$	Population	Share of Manufacturing & Construction	Production Primary/as % of GNP	Primary Production Exports as % of GNP
Congo	92.4	12.5	13.1	51.4	32.9
Ceylon	131.4	9.1	11.2	50.7	33.8
Iraq	201.5	6.4	12.9	55.6	45.0
Malaya	267.8	6.6	11.7	44.6	39.2
Jamaica	329.2	1.5	25.4	20.5	26.6
Venezuela	847.7	6.5	18.1	36.9	32.2

Data is given in 1960 US$ they are averaged for the period 1955 to 1963

These countries are listed as small primary/export-orientated

Table extracted from Table 11 of Chenery and Taylor, 1968 op.cit.,

with about a quarter of the West Malaysian population but a per capita income slightly higher than the West Malaysian, had a sector twice as large. Countries like the Congo who had a larger population but showed a per capita income about a third that of West Malaysia, had also exceeded the West Malaysian industrial performance.

This comparison shows that the size of the market required for the efficient growth of different industries varies from industry to industry and that some industries such as the chemical industry require a large market for optimum production. It also shows that the larger the market, the larger the variety of industries but import substitution can be achieved at a low level of income for larger countries (in terms of population numbers) and at a high level of income for smaller countries.

Thailand serves as another example, not mentioned by Chenery and Taylor but relevant because it is within the South East Asian region. With a per capita income of US $130 in 1960, Thailand[1] had a manufacturing sector contributing 12.1 against West Malaysia's per capita income of US $309 and a manufacturing sector of 8.7 per cent of GDP. Thus, on the basis of income and size the level of industrial development achieved by West Malaysia was low.

---

1. Mctaggart, W.D., 'Industrialization in West Malaysia 1968, Occasional Paper No. 2. Centre for Asian Studies, Arizona State University, Jan. 1972. P. 6.

The second factor, resource base of the country, can be put forward as an explanation for slow growth of the manufacturing sector. The restricted range of raw materials and natural resources which lent themselves to industrial development given the technological know-how of the country imposed a limitation to industrialisation. Although iron ore was produced in substantial quantities, the lack of coking coal among other factors, was a major handicap. Other metallic minerals were not produced in sufficient quantities to support local manufacturing industry.[1]

Secondly, the continuation of the policy of free enterprise after independence and the export of land-based products namely, rubber and tin testify to the comparative advantage that the country has in the production and processing of these commodities. In their production the country utilizes relatively more of the factors of production which she is endowed with. These are:

a) the natural resources of extensive areas of foothills and undulating land, soils and a tropical climate conducive for the production of rubber at a low cost.

b) the alluvial deposits of tin ore which enabled the use of cheap and simple technology for the exploitation of the mineral.

---

1. Ooi Jin-Bee, Op.cit., P. 328.

The comparative advantage of these resources was also evident in that one acre of rubber could produce considerably higher returns than an acre of padi. As a consequence, a third of the country's imports consisted of foodstuffs financed by the primary sector. Furthermore, the high level of per capita income the country had achieved compared to the other South East Asian countries, accrued to the fact that West Malaysia's share of primary exports to GNP were high (39.2 per cent), one of the highest in Chenery and Taylor's classification, surpassed only by the export percentage of Iraq. Rubber and tin constituted 80 percent of the exports during this period.

This argument points to the conclusion that returns from resources in the form of agricultural and mineral export commodities failed to divert investments from the plantation and mineral sectors into industrial activity. Furthermore, during this period the move to diversify the primary export base with investment into oil palm cultivation was under way.

However, undue emphasis cannot be placed on the resource factor, because the period under consideration marked the beginning of the post-independent era and a sufficient gestation period has not been given for the change in policy to be effectively implemented.

Economic policy has also played as important a role as the resource base in the slow take-off of the manufacturing sector. The West Malaysian policy of industrial promotion was based on the principle of free trade. Since the private investor was vested with the power to finance industry and decide on the nature of

the manufacturing product that would be viable, a time lag during which the foreign private investors studied very closely the economic climate in the newly independent country was bound to take place. This must result in a slow performance in the initial stages.

Secondly, the complete absence of any protection to prospective industry apart from the pioneer status benefits meant that competition from established brands of imports had to be seriously evaluated by investors. The combined effect of both these reactions was seen in the slow take off of industrial activity.

Lastly, the lack of entrepreneurial skill especially, in modern productive techniques and methods of organization among the local population also restricted the pace of industrialization. The difficulty of inducing local capital, which tended to be very conservative,[1] to invest in new lines of enterprise which carried with them a certain element of risk was compounded by the lack of entrepreneurial skills.

The industries that existed in the early years of the post-independent period were associated with primary producing and trading activities or could be classified as those that enjoyed considerable natural protection from foreign competition. These included operations which had to be performed on the spot and industries sheltered by high transport costs or other special advantages of location. Among these, manufacture

---

1. Ooi Jin-Bee, Op.cit., P. 328.

of food, beverages, tobacco, engineering products and miscellaneous consumer goods such as rubber goods, furniture and printing were most important. The structure of the industry in the early period supported the arguments presented above.

Despite the delayed beginning and slow performance at the start, the manufacturing sector grew rapidly from then onwards. Over the 1957-1968 period, its contribution to GDP grew at an average annual rate of 9.4 percent. The total growth of 45.6 percent was achieved over the entire period.

Table 3.3 compares the average annual growth of the manufacturing sector with that of the other sectors of the economy. The growth is considered within five year periods which coincide with the period of the development plans. But the Censuses of Manufacturing have been taken in 1959, 1963 and 1968. In line with subsequent discussion which will draw on the census, the growth rates during these periods have also been worked out.

The table shows that the rate of growth in the manufacturing sector shot up in 1963. This date coincides with the date for the formation of Malaysia. The prospect of serving a Malaysian market[1] led to rapid expansion of existing plants and the establishment of new manufacturing units. Between 1963 and 1968 the manufacturing sector had a growth rate more than twice that of the Agricultural sector and twice the growth

---

1. This included Singapore, Sabah, Sarawak and Malaya.

Table 3.3 AVERAGE ANNUAL INCREASE IN VALUE ADDED OF MANUFACTURING COMPARED WITH THE GROWTH IN OTHER SECTORS AND GROSS DOMESTIC PRODUCT

Sectors	1957-60	1960-65	1965-68	1959-63	1963-68	1957-68
Agriculture, Forestry, Hunting & Fishing	8.1	0.004	8.3	0.7	4.3	4.5
Mining & Quarrying	8.2	14.6	1.5	19.2	9.3	15.9
Manufacturing	8.1	9.5	10.6	6.7	12.3	9.4
Construction	14.0	15.1	- 0.34	24.6	2.7	10.6
Power, Water & Sanitation	5.2	13.4	14.5	16.3	15.0	11.5
All other Services	6.3	6.9	1.0	7.4	3.2	4.8
GDP	7.1	5.7	4.0	6.2	5.6	5.6

Source: TABLE A3:3

of the GDP.

The indices of growth with 1957 as the base year are a better indicator of its rapid growth vis-á-vis the other sectors. Figure 3.1 shows that in 1968, the manufacturing sector recorded an index of 263.5, a very close second to power (307.9). Manufacturing achieved an index five times that of agriculture by 1968. The mining and quarrying sector reflected its vulnerability to international fluctuation in price.

The role of the manufacturing sector is also reflected in its increasing contribution to GDP. Table 3.4 shows that by 1968 it contributed 12.3 percent to GDP. A steady growth rate was also reflected after 1960, a feature which was alien to most of the sectors of the economy, but most desired for achieving stability. During the same period,agriculture's share declined from 36.8 percent to 32.2 percent, although it continued to maintain its rank in the GDP.

The manufacturing sector's role in the increase in GDP is a better measure of its potential and growing significance to the economy. Table 3.5 shows that over the entire period, 1957 to 1967 manufacturing was responsible for 16.8 percent of the increase in GDP, the second highest contribution after the service sector. An assessment over the entire period tends to obscure its increasing role in the growth of the economy with time. This is reflected in the breakdown of the post independent era into shorter time periods.[1]

---

1. The choice of the specific time periods is governed by the fact that data on employment are available only for the years 1957, 1962 and 1967. To enable comparison to be made between contribution to GDP and contribution to employment the breakdown as shown was necessary.

Fig: 3.1 INDICES OF GROWTH IN REAL VALUE OF EACH SECTOR IN CURRENT PRICES AT FACTOR COST FROM 1957-1968. BASE YEAR IS 1957 = 100

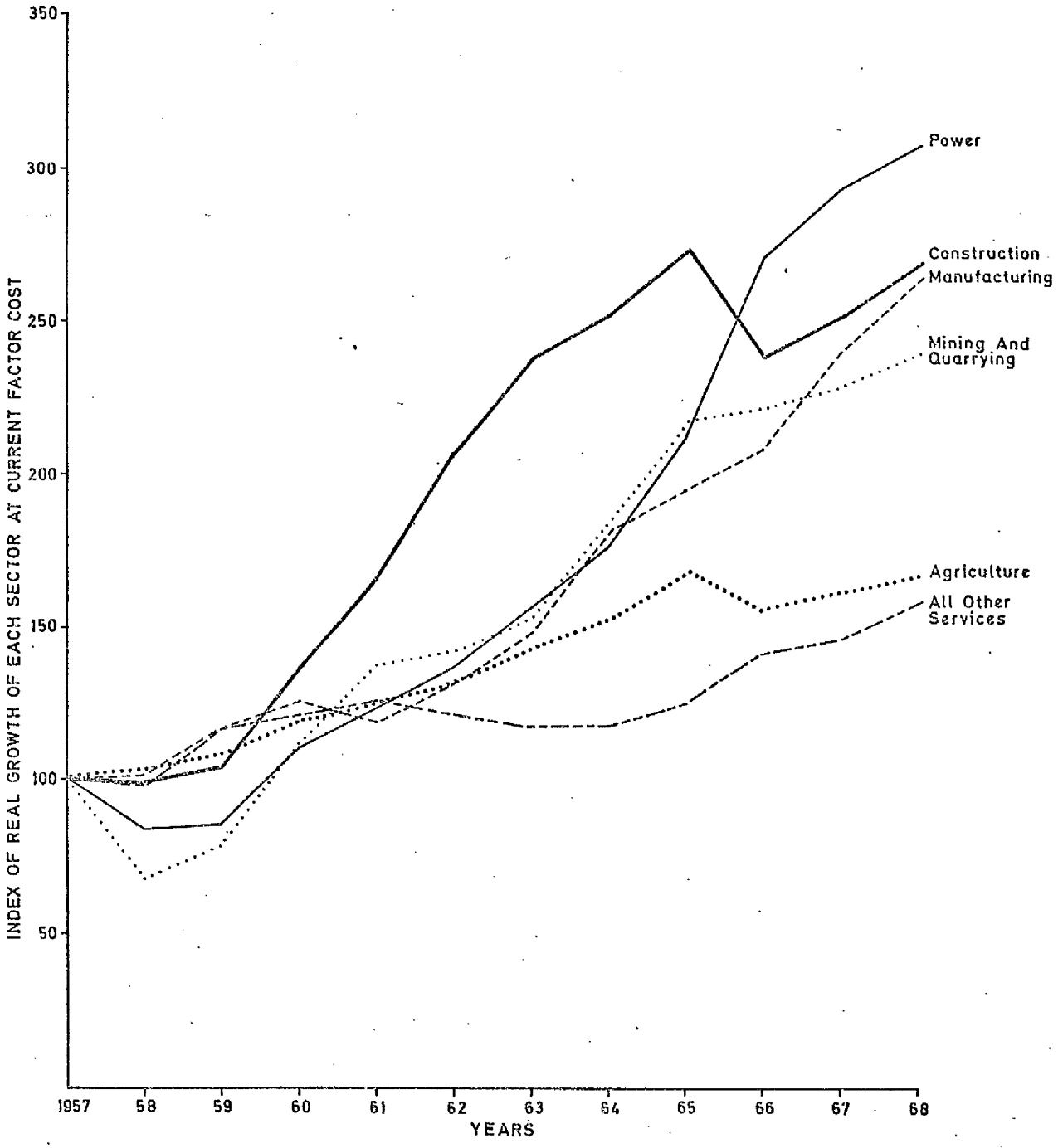


Table 3.4 SECTORAL CONTRIBUTION TO GROSS DOMESTIC PRODUCT IN PERCENTAGE FROM 1961 TO 1968

Sectors	1961	1962	1963	1964	1965	1966	1967	1968
Agriculture, Forestry, Hunting & Fishing	35.0	33.2	31.5	29.5	28.6	32.0	31.3	32.2
Mining & Quarrying	7.2	7.1	7.1	8.0	8.7	8.8	8.2	8.4
Manufacturing	8.1	8.6	9.1	10.4	10.2	10.8	11.9	12.3
Construction	3.6	4.4	4.7	4.6	4.6	3.9	4.0	4.0
Power, Water Sanitary Service	1.5	1.6	1.7	1.8	1.9	2.5	2.6	2.5
All other Services	44.6	45.2	45.9	45.6	45.9	42.0	41.6	40.6

Source: Appendix Table A.3.3

From 1957 to 1962 the manufacturing sector ranked fifth in importance as a contributor to the increase in GDP. Almost 65 percent of the increase was brought about by the increase in the value added in the service and agricultural sectors. But the situation changed rapidly in the 1962 to 1967 period. The manufacturing sector almost trebled the value added and moved upwards to third position as a contributor to the increase in GDP. The difference between its contribution and that of agriculture was slight. The relative importance of the manufacturing sector cannot be attributed to the poor performance of the agricultural sector, but it reflected in no uncertain terms the differences in the productivity of the two sectors.[1] Thus, it can be concluded that at the close of the initial period of industrialization and within ten years of rapid development, the manufacturing sector was responsible for almost a fifth of the increase in GDP, a position second to the agricultural sector.

This performance was remarkable considering the fact that Government was using two methods to diversify the economy. As a result of its deep commitment to the social and economic development of the rural sector and in an attempt to reduce the economic imbalances between the Malays and the non-Malays, greater emphasis was placed on agricultural development

---

1. Lim, D., Economic Growth and Development in West Malaysia 1947-1970, Oxford University Press. 1975 P. 202.

Table 3.5. SECTORAL CONTRIBUTION TO THE INCREASE IN GROSS DOMESTIC PRODUCT WITHIN CERTAIN PERIODS

Sectors	1957-1962	1962-67	1957-1967
Agriculture Forestry, Hunting & Fishing	258 20.77%	444 25.35%	702 23.47%
Mining & Quarrying	116 9.34%	236 13.49%	352 11.77%
Manufacturing	113 9.10%	389 22.24%	502 16.78%
Construction	125 10.06%	49 2.80%	174 5.82%
Power, Water & Sanitation	23 1.85%	99 5.66%	122 4.08%
Transport and Communications	52 4.19%	101 5.78%	153 5.12%
All other Services excluding transport	555 44.69%	431 24.64%	986 32.97%
Increase in GDP	1242	1749	2991

Note Actual values in M$ million.

For calculations only the terminal values were used.

For purposes of comparison with the next table sectoral contributions to increase in GDP for period 1962 to 1967 rather than 1962-1968 were calculated.

in the 1960's. This consisted of controlled and Fringe Alienation schemes, State Government Schemes and schemes developed by the Federal Land Development Authority (Felda).[1] Between 1961 and 1965, 399,700 acres of new land were opened up for modern agriculture and from 1966 to 1970 another 284,000 acres were converted to agriculture. In contrast, development in the manufacturing sector rested solely on the private sector with Government providing the basic infrastructure and the tax incentives outlined earlier.

This comparison shows that the average annual rates of growth of real value added of the agricultural and manufacturing sectors differed greatly. Between 1960-67 the value-added of the agricultural sector was 4.2 percent compared with 8.5 percent for the manufacturing sector.[2]

It is important to emphasise here that the contribution of the manufacturing sector to the national economy does not mark the climax of its performance at this stage, but it was a transition to a greater role that the sector promised to play in the economy. In its role in diversifying the West Malaysian economy the sector had so far achieved the objective outlined in the Government policy.

Although the creation of employment was not stated explicitly as an objective of the industrial development policy at the time of independence, the

---

1. Lim, David, Op.cit., P. 183-199.

2. Ibid., P. 202.

problem of unemployment was referred to in the First Malaysia Plan. Sectoral employment targets were set for the 1966-1970 period (the period of the First Malaysia Plan). During this period the Government aimed at creating 377,000 new jobs. Of these, it was intended that the manufacturing sector would create 36,000 new jobs or 9.6 percent of the target.[1]

Data on employment by major sectors is compiled for the years 1957, 1962 and 1967 in Table 3.6. The table indicates that the manufacturing sector's contribution to employment was 6.4 percent in 1957 and increased to 8.5 percent in 1967. Agriculture and service sectors, combined accounted for 80 percent of the employment. Although the manufacturing sector ranked third as an employer, its contribution to employment was far below the service and agricultural sectors. In 1957, its contribution to employment was two percent below its contribution to output but by 1967 the margin had widened to 3.4 percent.

Between 1957 and 1967 the West Malaysian workforce increased at an annual rate of 3.2 percent. But table 3.7 shows that the total employment during the same period grew at an annual rate of 1.39 percent creating less than half of the jobs required. Compared to the overall performance, the manufacturing sector showed an employment growth rate of nearly three times

---

1. Malaysia, First Malaysia Plan, 1966-1970. Government Printers, Kuala Lumpur 1965. P. 80.

Table 3.6 EMPLOYMENT BY MAJOR SECTORS 1957-67

	1957	1962	1967
	Actual numbers (000)		
Agriculture Forestry, Hunting & Fishing	1244.8 58.6%	1262.0 54.7%	1275.5 52.2%
Mining & Quarrying	58.5 2.8%	45.6 2.8%	67.4 2.8%
Manufacturing	135.7 6.4%	156.8 6.8%	208.6 8.5%
Construction	67.8 3.2%	46.7 2.0%	83.9 3.4%
Power, Water & Sanitation	11.5 0.5%	8.4 0.4%	17.7 0.7%
Transport & Communications	74.8 3.5%	77.9 3.4%	94.5 3.9%
All other Services	533.0 25.1%	708.4 30.7%	695.9 28.5%

Source: 1957 data extracted from Population Census 1957 Report No. 14, p.31.

1962 data from the Sample Survey of Employment, Unemployment, West Malaysia, 1962.

1967 data is from Malaysian Socio-Economic Sample Survey of Households 1967/68.

The data for the different years is not comparable because for 1962 the working age group was defined as 15 to 70 and in 1957, 1967 it was defined as 15-64.

See Appendix A3.4

Table 3.7 AVERAGE ANNUAL INCREASE IN EMPLOYMENT IN DIFFERENT SECTORS 1957-67 IN PERCENTAGES

Sectors	1957-62	1962-67	1957-67
Agricultrure, forestry hunting & fishing	0.27	0.21	0.23
Mining & Quarrying	-4.42	8.10	1.44
Manufacturing	2.92	5.87	4.37
Construction	-7.18	12.42	2.14
Power, Water and Sanitation	-6.12	16.28	4.28
Transportation and Communications	0.82	3.92	2.42
Services	5.85	0.35	2.71
Total Employment	1.63	1.16	1.39

Source: Calculated from data in Table 3.6.

Note: In the absence of adequate data the sample of 1962 was used and the average annual change was calculated by using terminal values. The formula used was $R = \text{anti log } \left(\frac{\log x}{t}\right) - 1$

R - rate of annual change

x - ratio of terminal value over initial value of the specified period

t - time span of the specified period, for example 1957-62, t = 5

As the 1957 and 1967 figures are based on Census and survey data respectively, they do not provide the most accurate estimates but the definition of employment, based on working age group of 15-64 holds for both periods.

that of the total. Its annual contribution was higher during the 1962-1967 period, a performance four and a half times the increase in all employment. But as this increase was worked from a small absolute figure, the problem of unemployment could not be overcome. In 1967, West Malaysia had an unemployment rate of 8.8 percent compared to an unemployment figure of 6.0 in 1962.[1]

The worsening unemployment situation, however cannot be explained in terms of the slow growth of employment in the manufacturing sector alone, because, although it was clear that employment lagged behind the growth in output in manufacturing, the increase, nevertheless, was significant.

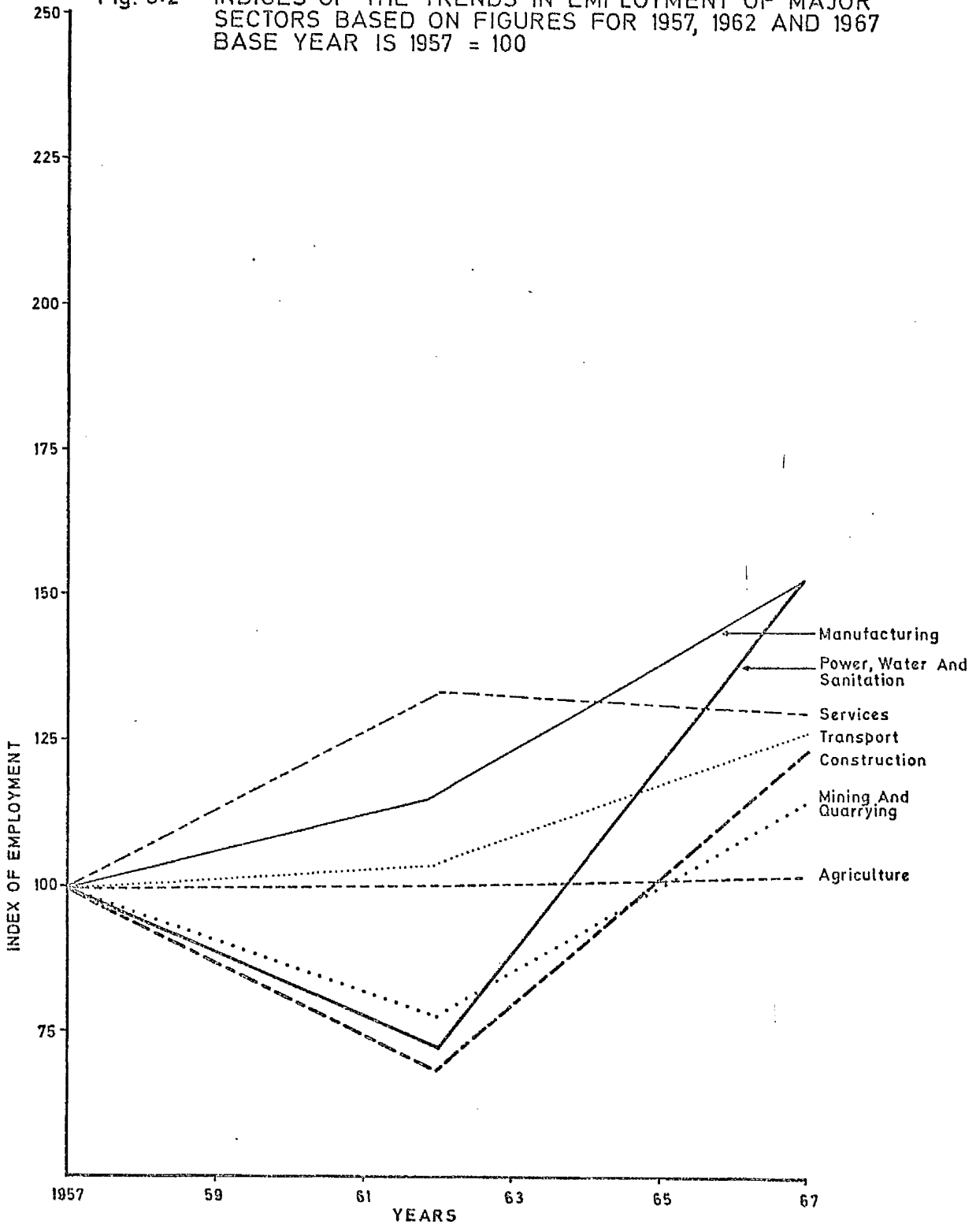
Other factors had also contributed to the increasing unemployment problem. In the 1962-1967 period, estate employment was reduced by 54,000 due to the fragmentation of estates and the change from rubber to palm oil cultivation. This figure constituted a fifth of the estate employment.

Figure 3.2 shows the indices of growth in employment of the major sectors. Agriculture depicted an index of 102 for 1967 from 100 in 1957. Taking into account the reduction in estate employment, the increase had come about only by Government land settlement schemes. The manufacturing sector recorded an index of 154 in 1967 with a steeper rise in the last five years.

---

1. Lo Sum Yee, Op.cit., P. 21.

Fig: 3.2 INDICES OF THE TRENDS IN EMPLOYMENT OF MAJOR SECTORS BASED ON FIGURES FOR 1957, 1962 AND 1967 BASE YEAR IS 1957 = 100



The sectoral contribution to the increase in employment is worked out in Table 3.8. It shows that between 1957 and 1967 the Service sector had been responsible for half the employment created. Although the agricultural sector employed half the total workforce in the country, it contributed only 9.7 percent to jobs created during the same period. Between one-fifth and a quarter of the employment created was attributed to the manufacturing sector, while the breakdown for the 1962-1967 period shows that it was responsible for 38 percent of the employment. This testifies to the fact that despite its small contribution in terms of numbers, if not for this sector's performance the unemployment situation in West Malaysia could have been more distressing. But the disparity between its contribution to value added and that to employment leads one to infer that from the viewpoint of employment creation inadequate emphasis was given to the subject. The lack of appropriate incentives for the promotion of labour-intensive industry was pronounced.

Another inference can be made from the increase in the imports of capital goods. Although no official data on imports by end-use are available, the share of machinery and transport equipment in the total imports had increased from 13 percent to 20 percent in 1967.[1] Its annual growth rate was twice the growth rate of total imports. If the increase in such items was a valuable indication of the increase in fixed capital in the

---

1. Lo Sum Yee, Op.cit., P. 9 and 10.

Table 3.8 SECTORAL CONTRIBUTION TO INCREASE OR DECREASE IN EMPLOYMENT 1957 TO 1967

Sector	1957-62		1962-67		1957-67	
	(000)	%	(000)	%	(000)	%
Agriculture, Forestry, Hunting & Fishing	17.2	9.57	13.5	9.80	30.7	9.67
Mining and Quarrying	-12.9	-7.18	21.8	15.83	8.9	2.80
Manufacturing	21.1	11.74	51.8	37.62	72.9	22.97
Construction	-21.1	-11.74	37.2	27.02	16.1	5.07
Power, Water, Sanitation	-3.1	-1.73	9.3	6.75	6.2	1.95
Transport & Communication	3.1	1.73	16.6	12.06	19.7	6.21
All other Services	175.4	97.61	-12.5	-9.08	162.9	51.32
Total change	179.70	100.00	137.7	100.00	317.4	100.00

manufacturing sector, then some of the increase in employment had been substituted by capital inputs, in addition to the capital intensive development that resulted from imported techniques. The latter falls in line with the theory that technological transfers are more readily possible in industry than in any other sector. But the former, namely the substitution of labour, can be traced to the drawback of the payroll tax. Payroll tax was levied at the rate of 2 percent of the firm's payroll. This tax burden increased with the size of the labour force. Firms were thus encouraged to adopt capital-intensive techniques which would not only reduce the payroll tax but bring about further tax reductions by enabling the firms to qualify for pioneer status by fulfilling the capital investment requirements.

In addition to the weaknesses in the payroll tax and the system of incentives, it cannot be ignored that an abundance of unskilled labour does not justify the use of labour-intensive techniques. Workers were not used to an industrial routine and skilled labour was in short supply. Entrepreneurs were thus, reluctant to experiment by training labour. Furthermore, wages in Malaysia tend to be higher than those in neighbouring South-East Asian countries because of the impact of the high productivity of the primary export sector. These factors together with the failure of the Government, to spell out explicitly the need to create employment as an objective of the industrial policy contributed to the situation.

David Lim, however, also concluded using a least-square regression to measure the capacity of an industry to absorb labour, that the labour-absorptive capacity of manufacturing is relatively low,[1] and definitely lower than the 0.95 postulated in the First Malaysia Plan. Even if this explanation is valid the weakness in the product mix in relation to the factor endowment can be inferred. An analysis of the industrial structure would be more appropriate before any conclusions are drawn.

3.3 The Spatial Patterns

The Census of Manufacturing 1959 and 1963 do not provide a district-level breakdown. This may have been difficult in the early stages of industrialization as the provision of confidentiality of the Statistics Act forbids the deportment of Statistics from disclosing statistics on any measure of industrialization if fewer than three establishments operate in a locality. A state-level distribution is the best guide. Even so, much of the data consist of aggregated totals and there is no possibility of breaking them into components to analyse the spatial distribution of different types of industry.

The 1968 Census of Manufacturing is, thus a first attempt in portraying the district-level distribution of industrial activity. Its significance is note-

---

1. Lim, D., Op.cit., p. 152, 153.

worthy in that the year 1968 marks almost the end of the initial phase of industrialization based on the strategy of free enterprise with indirect assistance from the public sector. Furthermore, a gestation period of ten years from the inception of the national industrial policy is a fairly long period for it to be implemented. Using the pattern as a basis an evaluation of policy measures is adopted.

As the census failed to provide raw data for compiling a district-level profile of industrial activity, data from the Directory of Manufacturing Establishments are used. The Directory of Manufacturing Establishments is compiled from the unpublished data of the 1968 Census of Manufacturing.[1] As such, it has been possible to draw on relevant data from both publications.

The three volumes of the Directory consist of names and addresses of all establishments which were operating in 1968 tabulated by States, the four digit level M.I.C. and the employment size code. The individual establishments were recoded by districts, M.I.C. four-digit code and employment size code. The computer was used to cross-tabulate the data on these variables by districts. The manner in which the data are processed is explained in the Appendix A3.5.

---

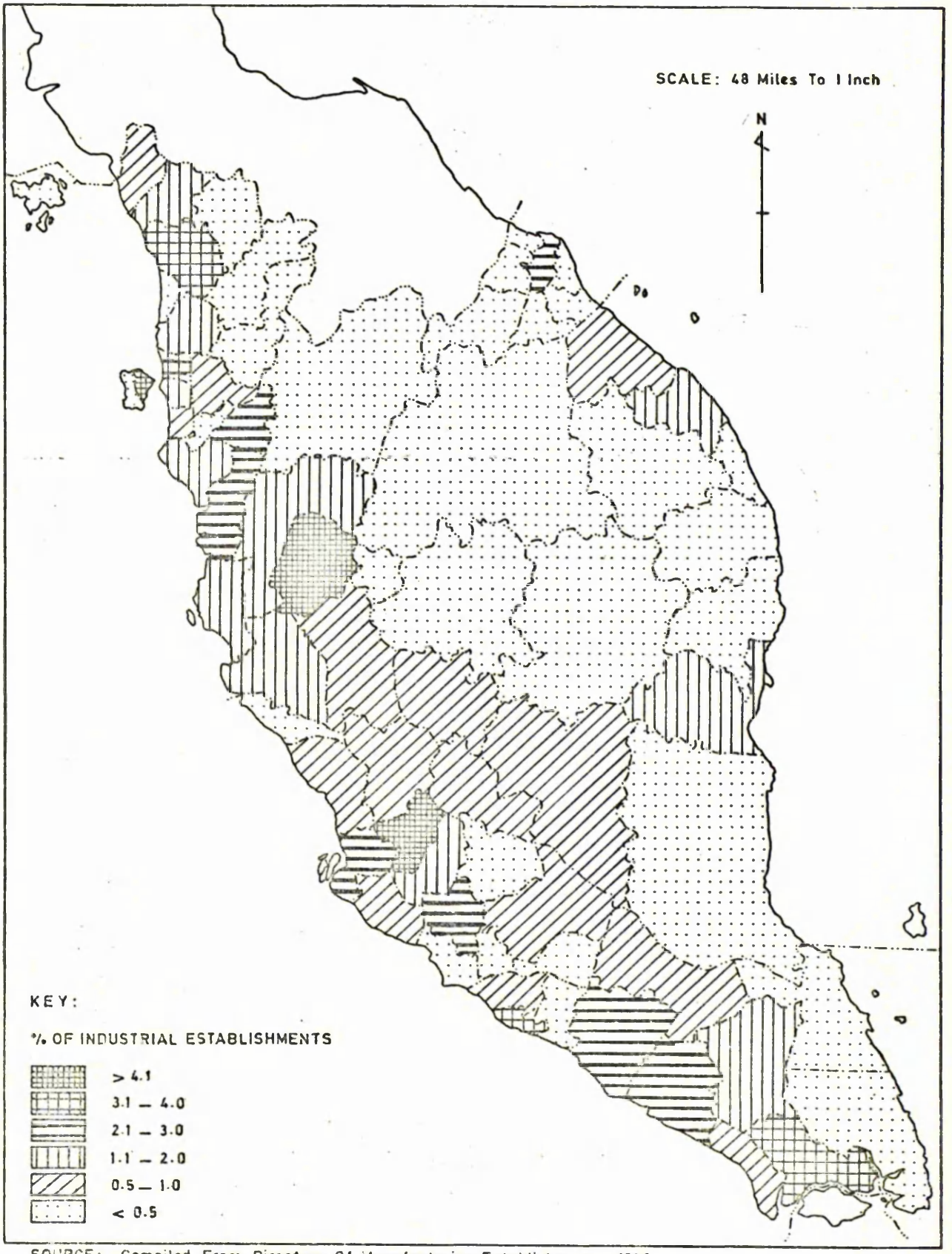
1. West Malaysia, Department of Statistics, Directory of Manufacturing Establishments, Vol. 1-3, 1970.

The Distribution of Industrial Establishments

The tendency for manufacturing establishments to be concentrated in a few districts had been firmly established by 1968 as shown in Figure 3.3. These districts were by no means contiguous. Industries tended to be concentrated in districts with either the national or the state capital and a definite west coast bias was evident. In the central and east coast the districts of Kuantan, Kota Bahru and Kuala Trengganu were an exception and all of them contain the respective state capital. The remaining districts, each contained only one percent or less of the manufacturing establishments. These districts reflected a predominantly agricultural orientation.

In the west coast seven districts: Kuala Lumpur, Kinta, Penang North-east, Johore Bahru, Malacca Central, Kota Star and Butterworth, in this order of importance contained more than half of the West Malaysian industrial establishments. At a lower level of importance, (districts which contained 2-3 percent of the industrial establishments each) were the six districts of Seremban, Klang, Kota Bahru, Muar, Batu Pahat and Larut/Matang. Collectively, 15 percent of the manufacturing plants were located in these districts. Another eleven districts containing 1-2 percent of the manufacturing units each, contributed 16.8 percent to the West Malaysian total. The remaining 44 districts (of which 30 had fewer than 0.5 percent of the manufacturing units each) contained 17 percent of the total manufacturing units.

Fig: 3.3 DISTRICT-LEVEL DISTRIBUTION OF ALL MANUFACTURING ESTABLISHMENTS, 1968



SOURCE: Compiled From Directory Of Manufacturing Establishments, 1968

The overall distribution depict one industrial belt and three regional industrial centres. The industrial belt was located within the Klang valley region (districts of Klang and Kuala Lumpur), while the regional industrial centres existed in Penang, Kinta and Johore Bahru districts. Two weaker growth points with a potential for growth into manufacturing centres appeared to be "budding" in the Kuantan and Kuala Trengganu districts in the east coast.

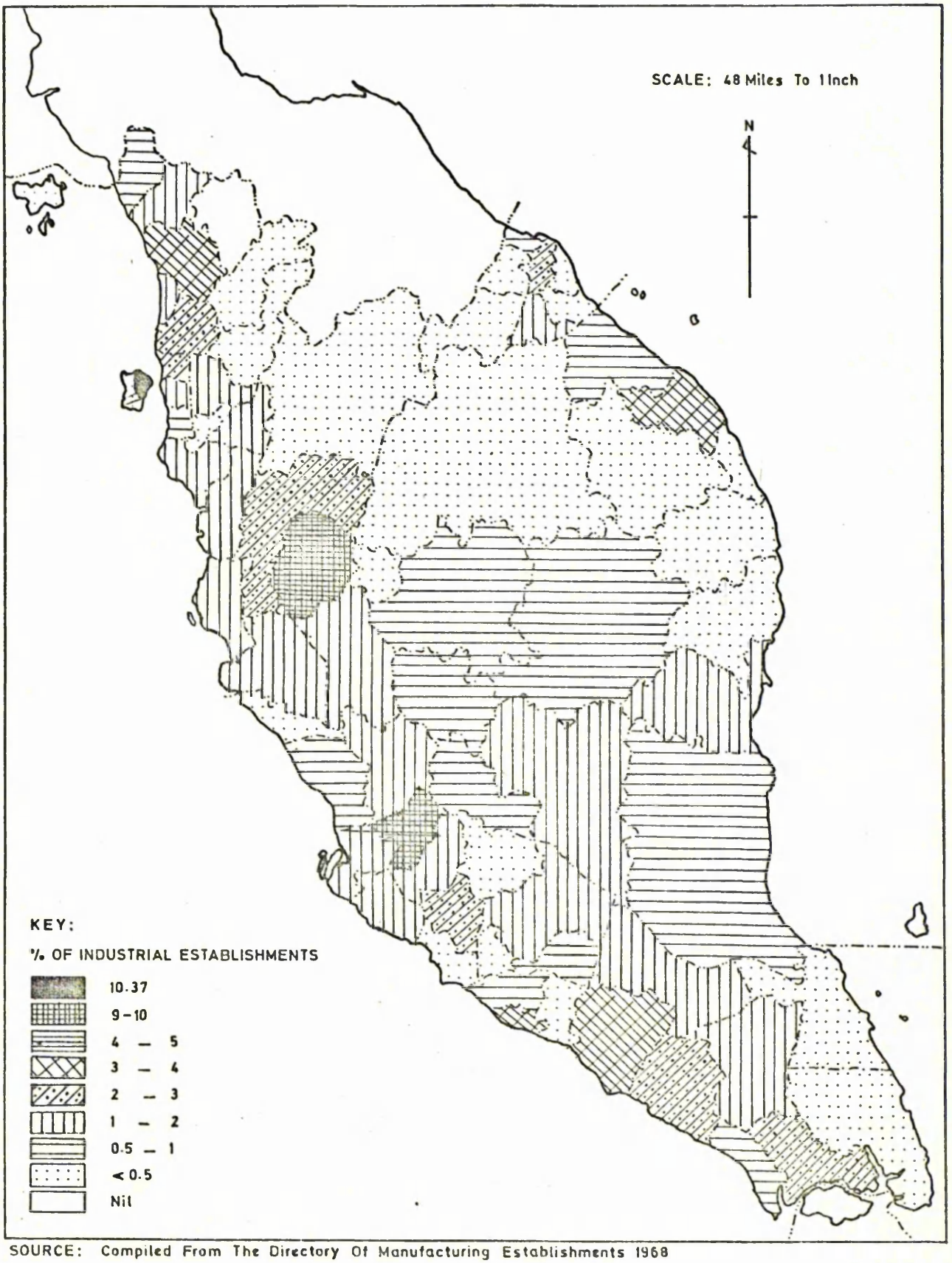
Employment Size of Manufacturing Units

A detailed analysis of industrial establishments by employment size indicates that 37 percent of the manufacturing units can be categorised as non-factory units. These were very small units with no paid full-time employment. They were operated by part-time paid employees or full-time unpaid family workers. They were usually sole proprietorships and small partnerships, financed and operated by local entrepreneurs.

Figure 3.4 shows that the non-factory size establishments were most widespread. The forty-four districts with less than one percent of the West Malaysian manufacturing establishments each had a high proportion of non-factory size establishments. In fact, half to 90 percent of the manufacturing units in these districts could be so categorised, as indicated in Table 3.9.

Among the districts with the largest number of West Malaysian manufacturing establishments the role of the non-factory size units varied. They were

Fig: 3.4 DISTRICT-LEVEL DISTRIBUTION OF NON-FACTORY SIZE MANUFACTURING ESTABLISHMENTS. 1968



SOURCE: Compiled From The Directory Of Manufacturing Establishments 1968

Table 3.9 PERCENTAGE OF MANUFACTURING ESTABLISHMENTS OF DIFFERENT EMPLOYMENT SIZE IN DISTRICTS CATEGORISED BY THEIR PERCENTAGE SHARE OF ALL WEST MALAYSIAN MANUFACTURING UNITS, 1968 (Extracted from Table in Appendix A 3.7)

Districts categorised by the Percentage share of all manufacturing establishments	No. of Districts in the Groups	Percentage of Manufacturing Establishments with				
		No paid full-time Labour	Below 20	20-49	50-99	100+
1. Over 10%	1	18.6	53.1	15.5	7.2	5.6
2. 5 - 9.9%	2	31.3	52.9	9.4	4.3	2.1
	x	42.2	49.4	4.8	2.1	1.5
3. 3 - 4	4	24.0	50.0	6.3	1.7	1.5
		36.1	59.2	9.7	5.5	8.8
4. 2 - 3	6	27.5	51.8	4.5	1.4	2.4
		37.3	59.5	7.2	3.4	7.7
	xx	50.5	43.5	3.7	1.4	0.9
5. 1.1 - 2	10	31.1	45.2	2.1	1.1	2.4
		43.7	54.6	8.4	3.3	4.1
6. 0.5 - 1	15	41.6	28.6	6.8	0.0	0.0
		65.9	50.0	1.4	2.1	5.5
0.5 - 1	xxx[4]	54.9	29.8	2.3	0.0	0.0
		63.5	42.1	8.0	3.3	2.3
7. Below 0.5	28	45.4	18.8	0.0	0.0	0.0
		93.8	55.6	17.9	10.7	3.2

Some districts display patterns different from the rest. x Exception in Group 2 - Penang N.E. xx Exception in Group 4 - Muar District; xxx four districts of Kuala Kangsar, Kuala Trengganu, Kubang Pasu and Ulu Langat are exceptions. For each group minimum and maximum values are given.

comparatively more important in terms of number in Penang N.E., Malacca Central, Kinta, Kota Star and Muar.

Three characteristics of the distribution of non-factory size manufacturing establishments were evident from the spatial pattern. First, in the more industrialised districts the non-factory size units existed and collectively these districts had a substantial number of the West Malaysian non-factory size establishments. It can be inferred from this that non-factory size establishments could have been the basis and the forerunners of the modern medium and large scale manufacturing units. Secondly, in the longer settled districts where traditional art and craft had flourished, the numbers of non-factory size units that were still in operation were higher. The districts of Penang N.E., Malacca Central, Kota Bahru and Kuala Trengganu were examples in point. Thirdly, in the agricultural, mainly rice growing areas, processing of agricultural foodstuffs, namely, rice milling was undertaken in small non-factory units. Districts of Muar, Kuala Muda, Butterworth, Kubang Pasu examplified this pattern.

Another category of manufacturing establishments was that employing less than twenty full-time paid employees. It was the largest single category of manufacturing units in West Malaysia in 1968, constituting 49 percent of all manufacturing units. Figure 3.5 depicts the district-level distribution of these units. The seven top ranking districts (according to the total number of units) maintained the same order of importance

with respect to the distribution of very small factory units (below 20 full-time paid employees). Collectively these districts had half of the very small units in them. But with the exception of Penang N.E., Batu Pahat and Muar, the percentage share of very small units in the thirteen ranked districts increased, indicating a tendency for polarization in a few districts.

Among manufacturing establishments of the small and medium employment size, namely 20-49 and 50-99 full-time paid employees, the trend towards greater localization is discernible from Figures 3.6 and 3.7. In the 20-49 employment size, Kuala Lumpur district alone contained over a third of the establishments in this category. Even Kinta and Johore Bahru districts had shares higher than their overall average, but in Penang N.E., and Malacca Central the percentage of these establishments was less than 6 percent and 3 percent respectively. This can be explained by the influence of a high concentration of non-factory size units in these districts. Seremban district had the fifth largest number of small units. It reflected the recent development of industry in the district, in general.

Establishments of the 50-99 employment size constituted only 3.3 percent of all manufacturing units. Only ten districts recorded existence of one percent or more of establishment of this size. Kuala Lumpur and Kinta districts, combined, had half the establishments of this size. Johore Bahru and Penang N.E. took third and fourth place. Outstanding importance of this

Fig: 3.5 DISTRICT-LEVEL DISTRIBUTION OF MANUFACTURING ESTBS EMPLOYING BELOW 20 FULL-TIME PAID EMPLOYEES, 1968

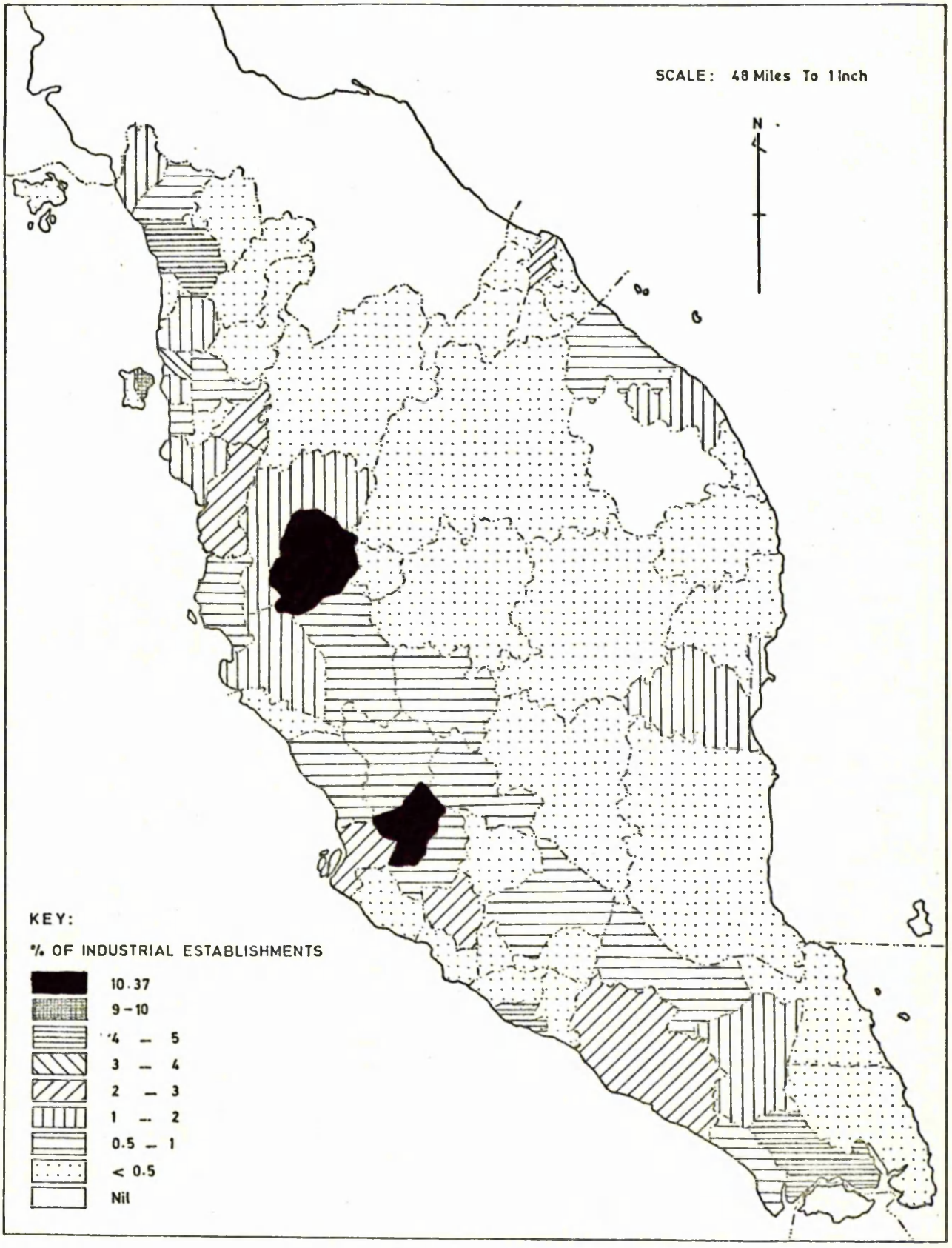


Fig: 3.6 DISTRICT - LEVEL DISTRIBUTION OF MANUFACTURING ESTBS EMPLOYING 20-49 FULL-TIME PAID EMPLOYEES. 1968

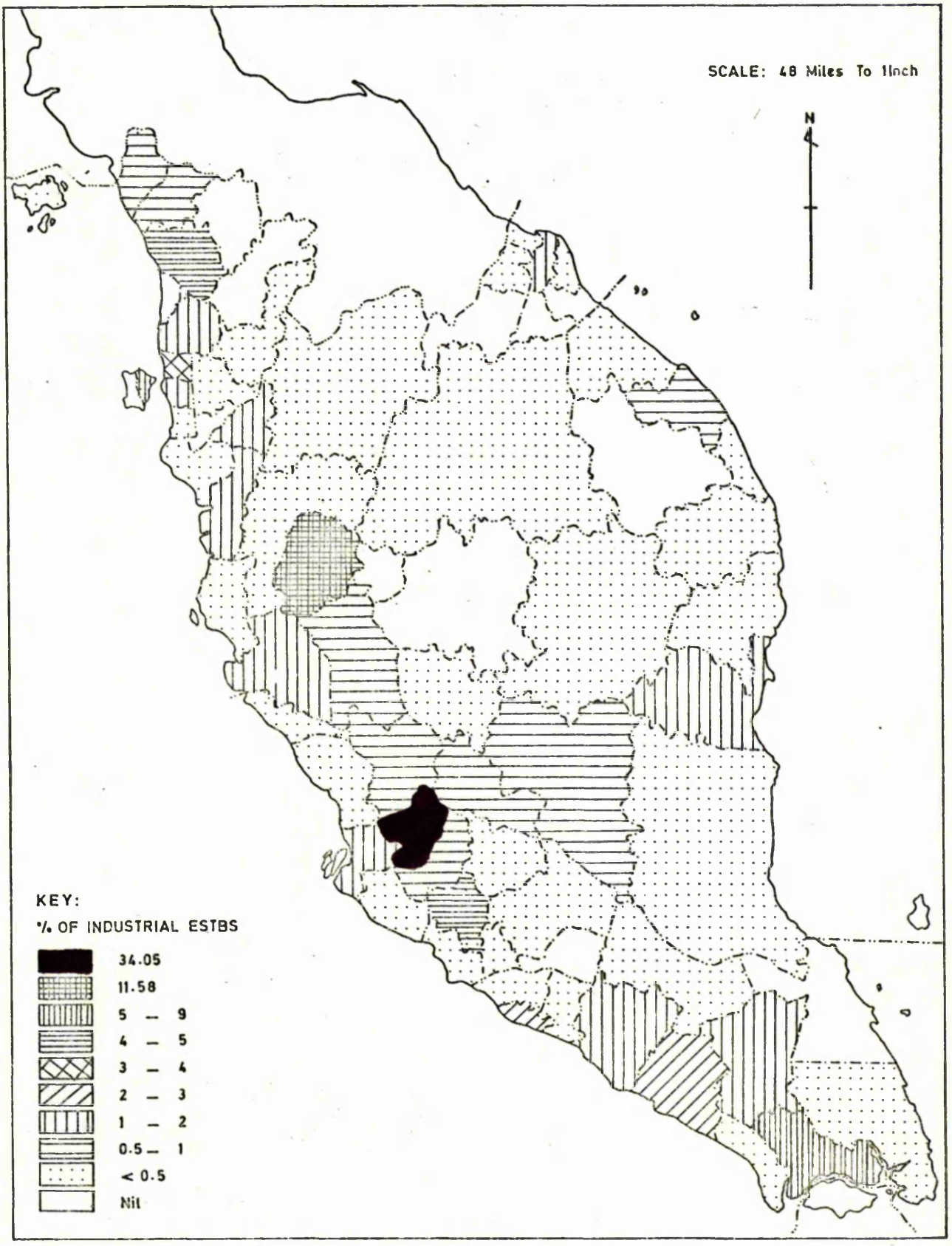


Fig: 3.7 DISTRICT-LEVEL DISTRIBUTION OF MANUFACTURING ESTBS EMPLOYING 50-99 FULL-TIME PAID EMPLOYEES, 1968

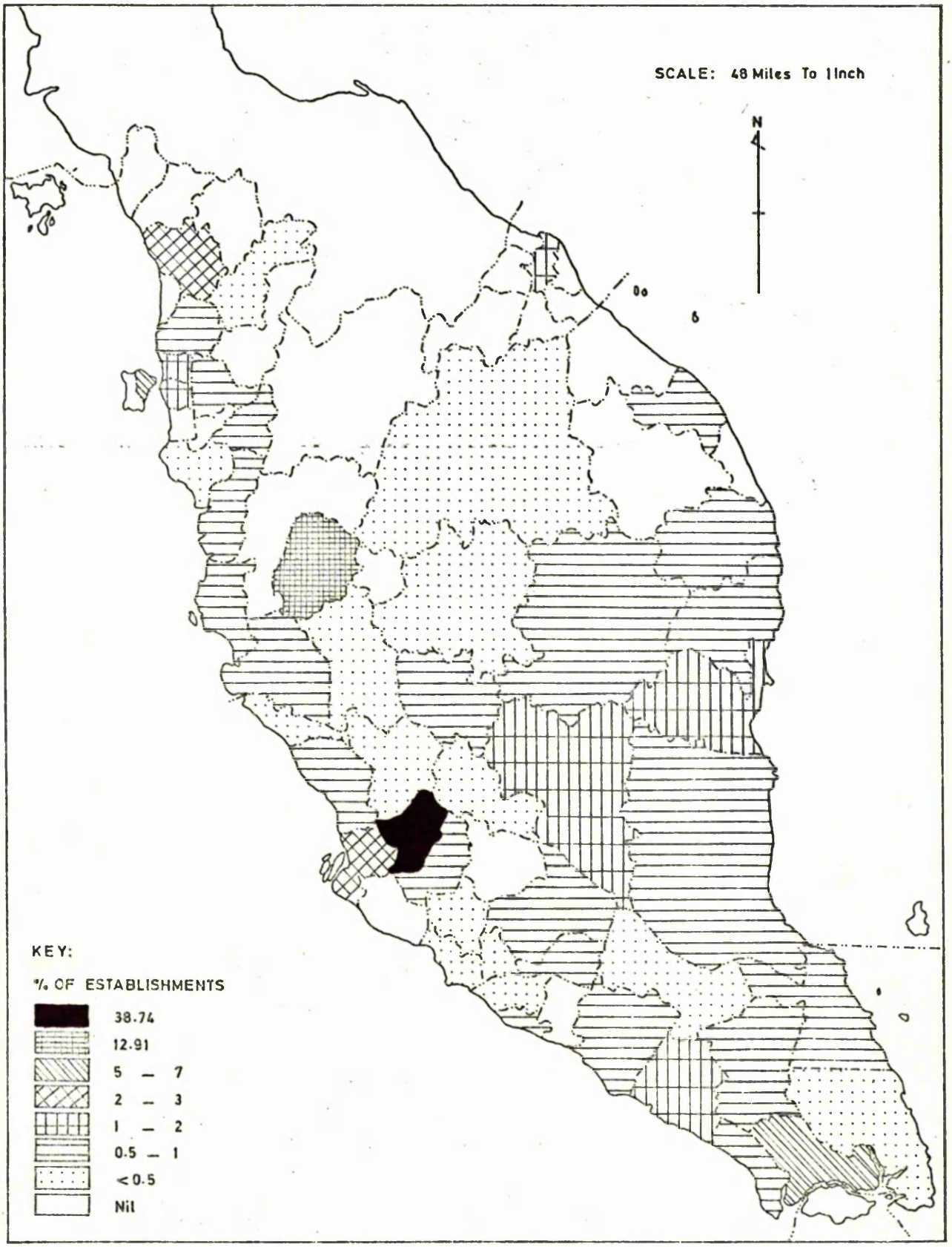
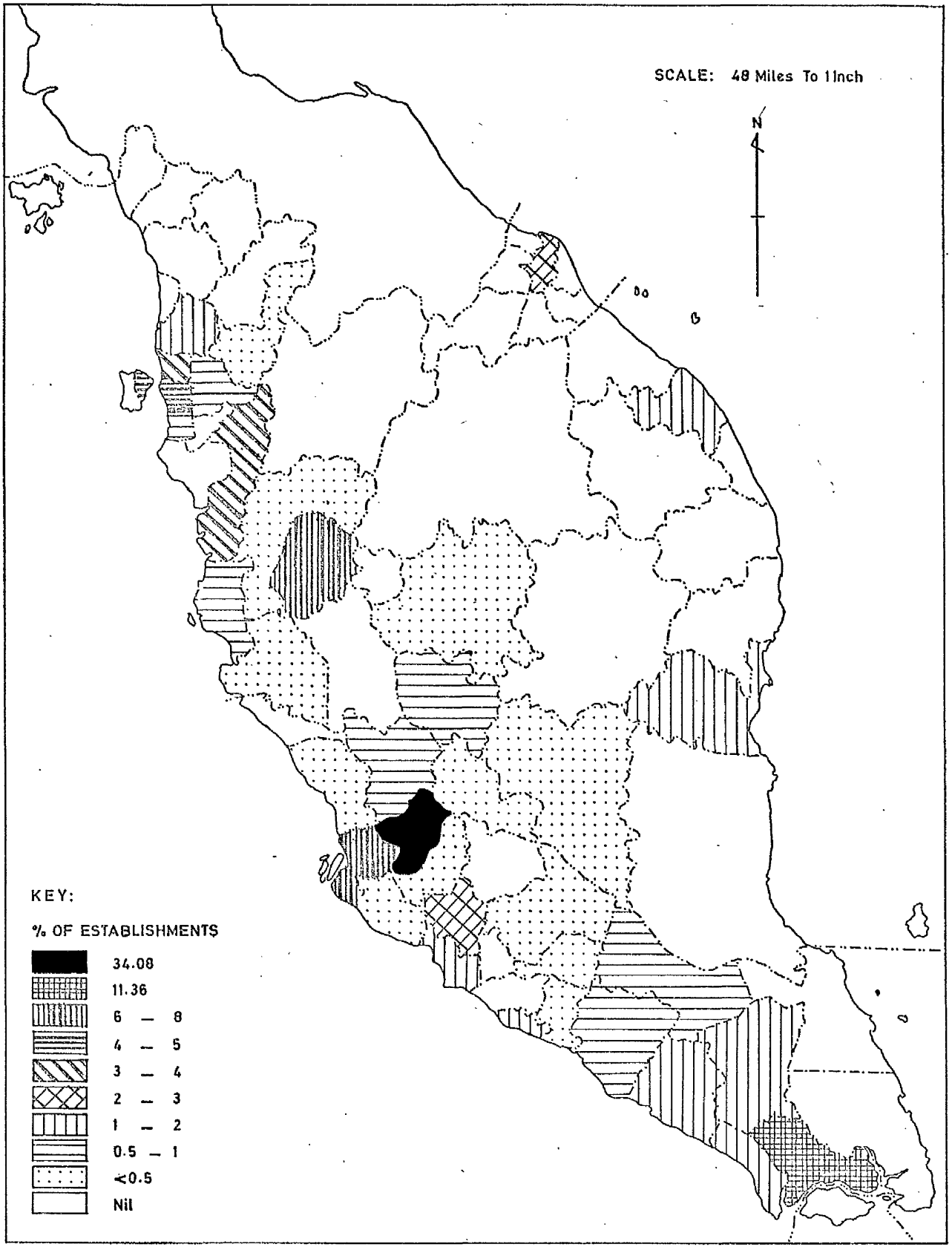


Fig: 3.8 DISTRICT-LEVEL DISTRIBUTION OF MANUFACTURING ESTBS EMPLOYING OVER 100 FULL-TIME PAID EMPLOYEES, 1968



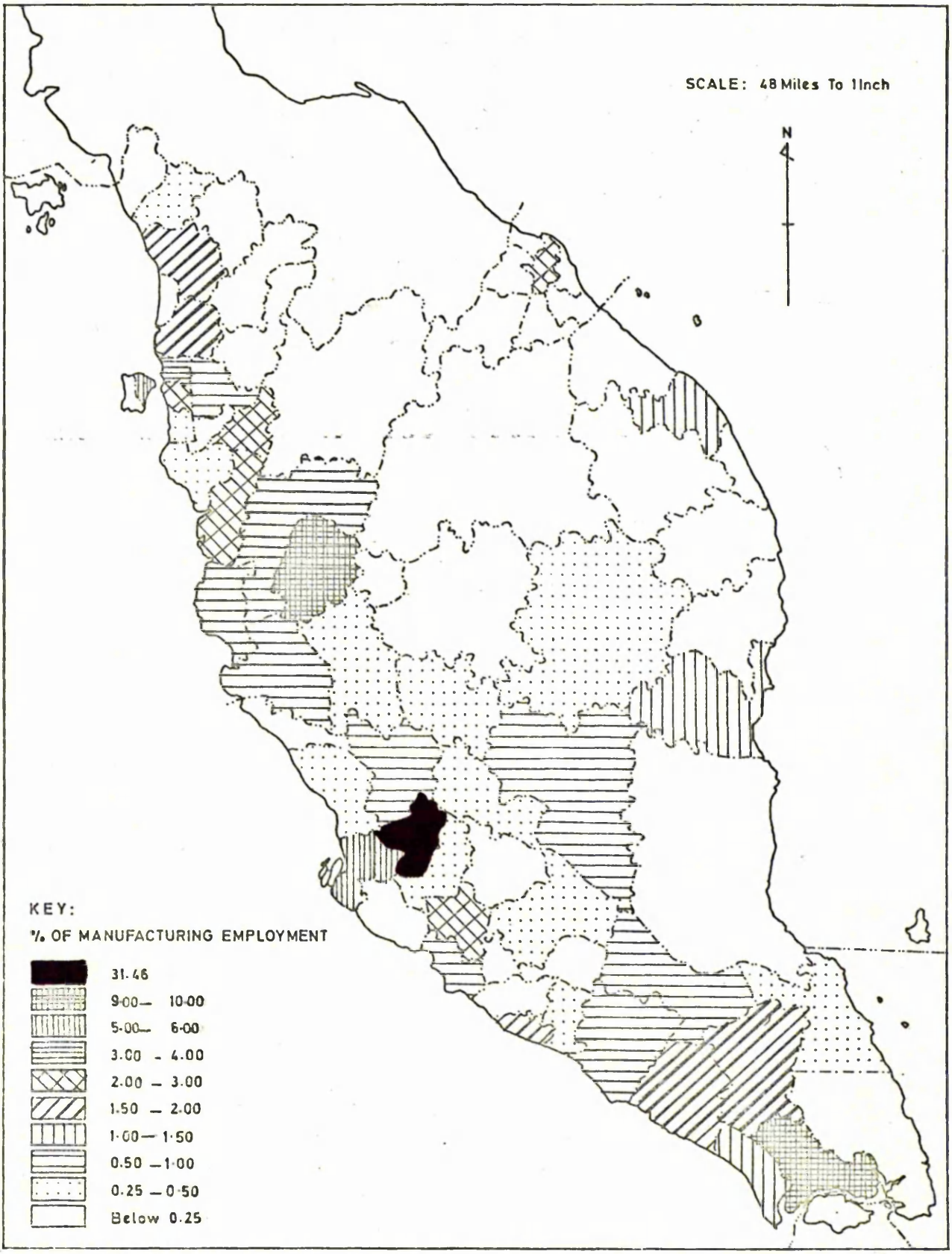
category of manufacturing units to Klang district was a testimony to the success of Shah Alam industrial estate in attracting medium size units. Kota Star district was also significantly placed with the concentration of large rice mills in the northern "rice bowl" of the country.

Lastly, large establishments, namely those employing one hundred or more full-time paid workers constituted only 3 percent of all manufacturing units. Figure 3.8 shows the district-level distribution of the large units in 1968. Concentration of large manufacturing units in the more industrialized districts was pronounced. Kuala Lumpur district alone had 34 percent of these units, while Johore Bahru had 12 percent. Kinta and Klang were in third and fourth places. The importance of Seremban, Bukit Mertajam, Butterworth and Larut/Matang at a subordinate level to the above mentioned districts reflected the success of industrial estates in dispersing large establishments to these districts. Port Dickson with the concentration of the petroleum refining industry was also significantly placed. Thirty-three districts did not have any large manufacturing units, another twenty had an odd one or two establishments of this size.

Distribution of Industrial Employment

Figure 3.10 and Table 3.10 depict the percentage and the number of workers employed in the manufacturing sector by districts in 1968. It is evident that district-level dispersion of employment in the sector fell short

Fig: 3.10 DISTRICT-LEVEL CONTRIBUTION TO ESTIMATED FULL-TIME EMPLOYMENT IN THE MANUFACTURING SECTOR AS PERCENTAGE OF THE TOTAL. 1968



of the distribution of manufacturing establishments in general, with exceptions in the Klang valley and in districts with industrial estates. This was contributed by the smallness of establishments in general and the dispersion of the non-factory size units which depended solely on family labour and part-time labour, thus, making no contribution to full-time paid employment. To arrive at a pattern the seventy districts were grouped into nine different groups according to their estimated contribution[1] to manufacturing employment. The maximum, minimum and mean percentage contribution of manufacturing plants of the four employment sizes is worked out for each group of districts, as shown in Table 3.10. Four main observations can be drawn from this investigation. First, the more significant the districts' contribution to employment in manufacturing, the greater was the role of medium (50-99) and large (100+ employees) manufacturing units in the creation of employment despite the capital-intensiveness of large plants. This was displayed by the first five categories of districts which constituted ten leading industrial districts in terms of industrial employment. The contribution of small manufacturing units (20-49) and very small units (Below 20 employees)in decentralising employment in manufacturing was noteworthy although the

1. Estimates of district-level employment in the manufacturing sector were used rather than the actual figures given by the 1968 Census because the employment of each establishment was withheld and only the employment size group to which it belonged was revealed. Estimates tend to be higher than the figures quoted by the Census since the mean value of each employment size is used for deriving the total.

Table 3.10. ESTIMATED CONTRIBUTION OF MANUFACTURING ESTABLISHMENTS OF DIFFERENT EMPLOYMENT SIZE TO DISTRICTS CLASSIFIED BY THEIR SHARE OF FULL-TIME PAID EMPLOYMENT IN THE MANUFACTURING SECTOR , 1968.

Group	Groups (classified by District's mfg. employment)		No. of Districts in each group	Estimated Contribution to district's mfg. empl. by estbs. with			
	%	No. of F.T. Empl.		Below 20 F.T. Empl.	20-49 F.T. Empl.	50-99 F.T. Empl.	100+ F.T. Empl.
1.	31.46	43265	1	13.7	18.4	20.2	47.7
2.	9.0 to 10.0	12,375-13,751	2	21.5	21.1	22.1	68.5[1]
				9.0	10.7	11.8	35.3[2]
				15.3	15.9	17.0	51.9[3]
3.	5.0 to 6.0	6,876-8,251	2	28.4	17.2	17.4	76.6[1]
				10.4	5.2	7.8	37.0[2]
				19.4	11.4	12.6	56.8[3]
4.	3.0 to 4.0	4125-5501	1	21.6	19.2	7.8	41.0
5.	2.0 to 3.0	2750-4125	4	22.8	27.4	11.3	67.5[1]
				12.9	12.4	6.2	47.0[2]
				35.7	19.9	8.8	57.3[3]
6.	1.5 to 2.0	2063-2750	5	38.1	37.2	24.7	71.4[1]
				11.1	8.1	5.5	35.0[2]
				24.6	22.7	15.1	53.2[3]
7.	1.0 to 1.5	1375-2060	3	25.1	20.4	27.2	70.5[1]
				13.5	10.3	9.1	27.3[2]
				19.3	15.4	18.2	48.9[3]
8.	0.5 to 1.00	688-1375	9	39.0	33.9	39.3	67.7[1]
				14.0	11.1	8.0	12.9[2]
				26.5	22.5	23.7	40.3[3]
9.	0.1 to 0.5	138 to 688	24	70.3	66.3	64.5	73.6[1]
				7.4	4.7	-	-[2]
				38.9	35.5	-	-[3]
10.	Below 0.1	137 and Below	19	100.0	93.8	32.3	36.8[1]
				20.6	-	-	-[2]
				60.3	46.9	-	-[3]

Mfg. Empl. - Full-time paid employment in the manufacturing sector.
Note F.T. Empl. - Full-time paid employment.

1. Maximum value of each group.
2. Minimum value of each group.
3. Mean value of each group.

Source: Compiled from Table A 3.10.

results achieved were meagre. In districts with less than 0.5 percent of estimated employment, the bulk of the industrial employment was created by small and very small plants. Too much emphasis cannot be placed on the contribution of medium and large size plants in the last group of districts (0.1 to 0.49 employment group) as reference to individual districts (Appendix A3.10) shows that an odd large plant tended to create this anomaly.

Districts with industrial estates namely Klang, Butterworth, Seremban, Johore Bahru, Larut/Matang and districts with localised specific industry such as Port Dickson and Pontian had a larger share of industrial employment compared to their share of establishments. In these districts the role of large plants in employment creation was outstanding, in fact, 67 percent of the industrial employment in these districts was created by these plants. Apart from the impact of large plants in districts with successful industrial estates and the first group of districts, small plants were responsible for creating a third to half of the industrial employment in the remaining groups. In the last two groups plants of this size were the main contributors to industrial employment in the districts' manufacturing sector.

District-Level Contribution to Value Added in Manufacturing

Another measure of the spatial dispersion of manufacturing activity is the contribution to value

Table 3.11. DISTRICT-LEVEL CONTRIBUTION TO VALUE ADDED IN MANUFACTURING 1968

	$(000)	% of total		$(000)	% of total
Kuala Lumpur	381,648	43.67	Sabak Bernam	1,466	0.17
Kinta	67,490	7.72	Batang Padang	1,355	0.16
Johore Bahru	58,710	6.72	Kubang Pasu	1,302	0.15
Port Dickson	49,453	5.66	Tampin	1,291	0.15
Klang	46,655	5.34	Kota Tinggi	1,142	0.13
Bukit Mertajam	32,073	3.67	Perlis	1,136	0.13
Butterworth	22,145	2.53	Kemaman	1,092	0.12
Penang N.E.	22,125	2.53	Dungun	1,047	0.12
Kluang	16,973	1.94	Baling	1,018	0.12
Seremban	13,862	1.59	Kuala Pilah	900	0.10
Malacca Central	13,620	1.56	Jelebu	878	0.10
Batu Pahat	11,885	1.36	Krian	850	0.10
Ulu Selangor	11,853	1.36	Kuala Langat	746	0.09
Kota Bahru	11,588	1.33	Jasin	744	0.09
Larut/Matang	10,987	1.26	Rembau	691	0.08
Dindings	8,521	0.98	Lipis	678	0.08
Pontian	7,951	0.91	Yan	489	0.06
Kuala Muda	7,444	0.85	Pasir Mas	388	0.04
Kota Star	7,193	0.82	Pekan	334	0.04
Kuantan	6,434	0.74	Upper Perak	295	0.03
Termeloh	6,279	0.72	Tumpat	258	0.03
Muar	5,516	0.63	Ulu Kelantan	251	0.03
Segamat	4,620	0.53	Besut	226	0.03
Nebong Tebal	4,061	0.46	Sik	176	0.02
Lower Perak	3,769	0.43	Langkawi	120	0.01
Alor Gajah	3,364	0.38	Marang	90	0.01
Bentong	3,251	0.37	Bachok	62	0.01
Kuala Selangor	2,507	0.29	Ulu Trengganu	52	0.01
Raub	2,073	0.24	Penang S.W.	52	0.01
Kuala Kangsar	1,998	0.23	Machang	47	0.01
Mersing	1,802	0.21	Bandar Bahru	37	0.00
Jerantut	1,748	0.20	Tanah Merah	21	0.00
Ulu Langat	1,670	0.19	Cameron Highlands	13	0.00
Kuala Trengganu	1,644	0.19	Padang Terap	9	0.00
Kulim	1,521	0.17	Total	873,851	100.00

Source: Extracted from Census of Manufacturing, 1968, p. 29-32.

added[1] in manufacturing by the districts. Table 3.11 shows that in 1968 the district-level contribution to value added reflected in no uncertain terms the dominant role of the Klang valley which was responsible for half the value added in manufacturing. The importance of Port Dickson and the petroleum industry in the manufacture sector was also pronounced. Two regional centres mentioned earlier also made significant contributions; while in the north west the contribution of Penang State was splintered among the three districts. Apart from the fourteen districts with at least a one percent contribution to value added, the importance of manufacturing industry in the other districts was more apparent than real.

3.4 Spatial Structure of Manufacturing Industry

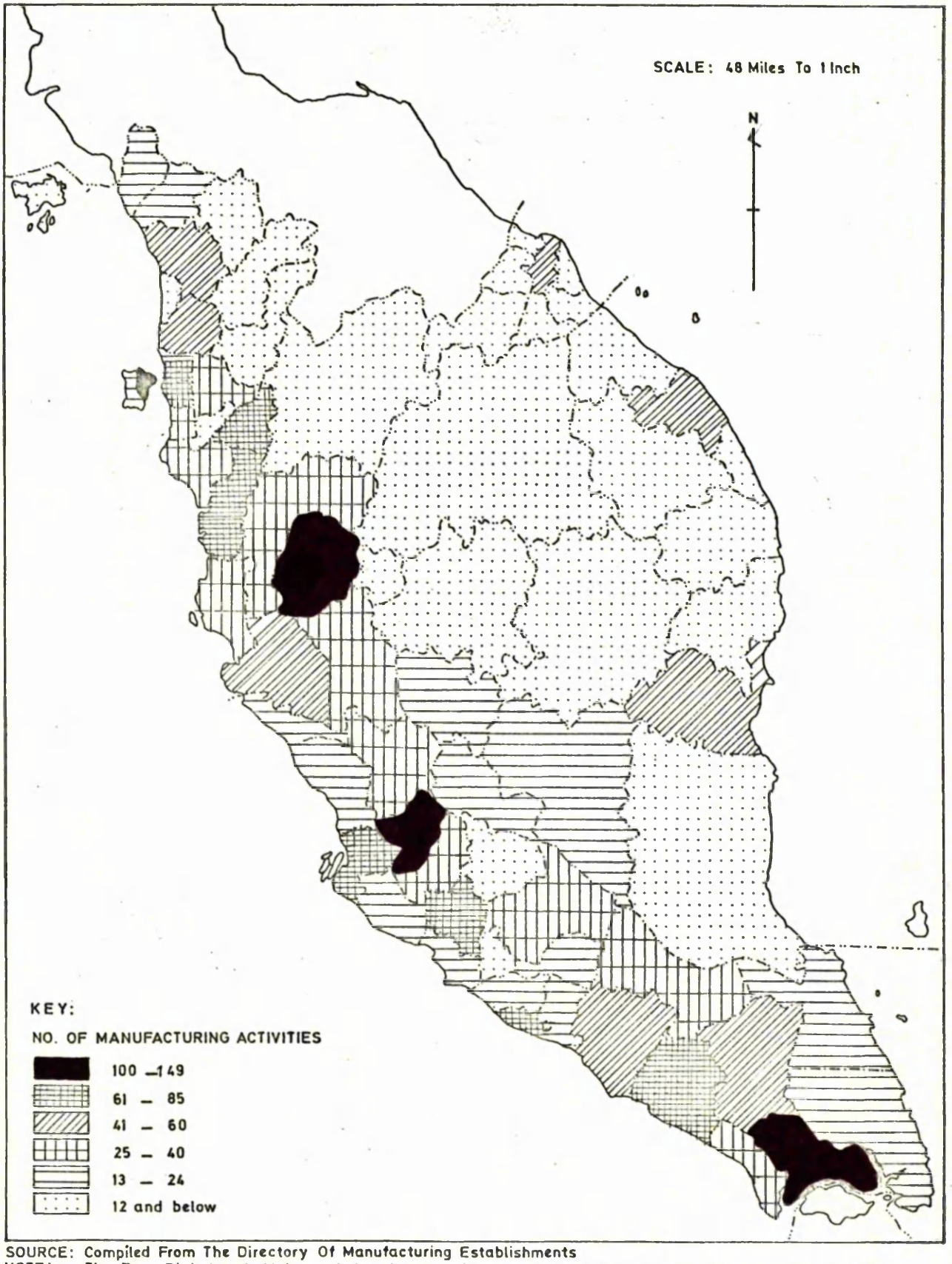
The spatial structure of manufacturing industry in 1968 is compiled from the information available in the Directory of Manufacturing Establishments.

A total of one hundred and seventy-nine manufacturing activities were in operation in 1968. The range of industrial activities was generally small. Figure 3.9 shows the district-level industrial profile. One most outstanding feature was that the greater the district's contribution to manufacturing activity the wider was its range of industrial activities. The largest number of manufacturing activities were in Kuala Lumpur district; it amounted to 149. The average

---

1. Value added is defined as Gross value of sales minus the value of materials purchased, plus/minus the change in stocks. Census of Manufacturing, 1968 P. 12.

Fig: 3.9 A PROFILE OF MANUFACTURING ACTIVITY BY DISTRICT. 1968



SOURCE: Compiled From The Directory Of Manufacturing Establishments
NOTE: The Four Digit Level, Malayan Industrial Classification Is Used For Defining Manufacturing Activity.

number of activities at the district-level was rather small amounting to 31. The median rather than mean was a better indicator of the industrial profile, it amounted to 22 activities.

Twenty-five districts, predominantly in the east coast and the north-west of the country had twelve or few activities. These were mainly districts with less than 0.5 percent of the total manufacturing establishments each. Districts possessing 0.5 to 2 percent of the manufacturing units each, displayed an industrial variety of 13 to 40. The only exceptions in this category of districts were Kuantan, Kota Bahru, Kuala Trengganu, Kluang and Lower Perak. These districts had 40 to 100 different industrial activities although the number of establishments was small compared with other districts within this range of manufacturing diversity.

Greatest industrial diversity, with over 100 manufacturing activities was found in the Klang valley and the three regional centres reinforcing their position as industrial centres and emphasising the concentration of industrial activity in a few districts in 1968.

If the seventy districts were divided into quartiles, then the upper quartile indicate a range of industrial activity of 149 to 48; the second quartile had a manufacturing diversity of 46 to 22, the third quartile contained 20 to 10 activities while the fourth quartile had the narrowest range, varying from ten to one.

Elementary resource-based industry as defined in Appendix A3.2, constituted 23 percent of the total manufacturing establishments in West Malaysia in 1968. This industry was as significant as it was widespread. Column one in Table 3.12 shows the role of elementary resource-based industry in districts grouped according to their industrial diversity. It also compares the importance of this industry vis-á-vis the other industries in the same districts. It can be deduced from the Table that the lower the range of industrial activity the greater the importance of elementary resource-based activities while the greater the industrial diversity the lower the significance of the elementary resource based industry in the manufacturing complex of the district.

In the twenty-five districts with fewer than twelve industrial activities in each, elementary resource-based activity was, in fact, the sole basis of manufacturing, comprising all or at least half the total number of manufacturing units.[1] In the next fifteen districts the role of this industry type was also pronounced. In

---

1. Although the definition of elementary resource based industry differs in this thesis from that used by J.J. O'Callaghan, this conclusion at a district-level study tends to be supported by his findings in the paper, 'Town Sizes and Thresholds for Manufacturing Activities in West Malaysia'. He has shown that resource-based industry often is the basis for the existence of a small town and that this industry does not in itself stimulate the development of other manufacturing activity although it is likely to contribute something to their growth.

   O'Callaghan, J.J., Town Size and Thresholds for Manufacturing Activities in West Malaysia, July 1971. Pahang Tenggara Regional Master Planning Study. Working Paper No. 39. P. 4, 10.

Table 3.12 INDUSTRIAL STRUCTURE OF GROUPS OF DISTRICTS CATEGORISED ACCORDING TO INDUSTRIAL DIVERSITY. 1968

Industrial Diversity No. of Activities	No. of Districts	Industry Groups: Elementary Resource-Based No. of Estbs.	%	Advanced Resource Based No. of Estbs.	%	Consumer No. of Estbs.	%	Intermediate No. of Estbs.	%	Capital Goods No. of Estbs.	%
Below 12	25*	45	100.0	4	13.6	8	33.3	2	3.4	6	24.0[1]
		2	50.0	0	-	0	-	0	-	0	-[2]
13 - 24	15**	86	82.7	6	16.1	19	38.7	4	4.8	23	46.4
		5	17.9	0	-	6	8.7	0	-	4	8.7
25 - 40	11	60	63.8	11	16.7	35	39.3	6	9.0	39	42.4
		11	12.0	1	1.4	5	13.8	3	2.3	12	12.8
41 - 60	8	176	53.0	20	12.7	103	46.8	10	4.7	58	36.5
		25xxx	21.0	4	2.2	38	21.3	3	1.7	30	16.0
61 - 85	7	63	37.3	23	9.9	150	44.8	35	12.1	89	32.3
		22	9.4	11	6.0	49	29.0	6	2.8	28	16.6
100 - 149	4	125	12.1	121	13.4	680	46.6	173	11.3	532	33.0
		30	7.7	29	6.7	162	37.7	41	7.9	101	27.8

1. First row presents the maximum value in the group.

2. Second row gives the minimum value in the group.

* Cameron Highlands is excluded from the analysis as it has all in 3 manufacturing establishments only.

** Port Dickson displayed an irregular pattern from the group because of its specialised industrial structure. Its share of intermediate industry was 26.7% because of concentration of petroleum industry.

xxx Kluang was an exception with only 7.9% of elementary resource-based because oil palm-processing is classified as an intermediate group. Within this group - Kota Star, Kuala Trengganu had an exceptionally high number (176-100 respectively) of elementary resource-based establishments namely small rice mills because of their location in rice-producing areas.

Source: Derived from Appendix Table A3.8.

districts with a larger industrial diversity the strength of this activity was displayed by the increase in the number of establishments rather than an increase in the size of the establishments; but in terms of percentage contribution to the district's manufacturing activity its share dwindled to as low as 8 percent in these districts.

Within the elementary resource-based industry the most widespread was rice milling undertaken in large and small rice mills in 66 districts of the country.[1] Saw Milling was the next most common industry, in operation in 60 districts. Rubber remilling and latex processing though labour-intensive were restricted to large plants and districts with a broad manufacturing base. Coconut oil mills were found in only 20 districts and rubber smokehouses were confined to 27 districts.

Tea factories and coffee beans hulling was localised in the Kinta, Penang N.E., Klang and Kuala Langat districts. Sago and tapioca mills were concentrated in districts in Kedah, Perak, Selangar, Malacca and Johore. Manufacture of wooden clogs, sandals, shoe heels and repair works basically operated as small non-factory size operations in the older settled, rural districts such as Batu Pahat, Kota Star and Malacca. Firewood activity was also restricted to rural districts. Rattan work and basket weaving was a family-based activity

---

1. District-level distribution of individual activities of the five broad industry groups is given in the Appendix Table A3.9.

in 24 districts with medium industrial diversity. Other activities like carpentry were widespread with a mushrooming of small manufacturing units in the industrially more diversified districts.

Different from the pattern of the elementary resource-based industry, was that of the advanced resource-based industry. This industrial category was under developed. Only 7.6 percent of the West Malaysian manufacturing units in 1968 could be classified as advanced resource-based. A locational bias for districts which showed greater industrial diversity was self-explanatory. (Table 3.12 column 2) Many of the units were capital-intensive and a market orientation rather than a raw-material orientation was evident. This industry-type was dominated by foreign enterprise. The largest concentration of manufacturing units was in Kuala Lumpur district, Kinta, Penang N.E., Johore Bahru and Butterworth in this order of importance.

The range of manufacturing activities within the group was extremely small, totalling up to seventeen, with six of them related to fruit and sea food processing, ten associated with forestry and one with the production of leather products. The narrow range of manufactures reflected the limited scope of the manufacturing sector at this stage of its development. It also emphasised the import-substitute stage of industrialization. However, the potential for this industrial category seemed to be indicated in the increase in the value added brought about by these activities.

Among the fruit and sea food processing, the pineapple canning industry was highly localised in Pontian., Johore Bahru and Klang, closely tied to the raw material production areas. Sea food processing, especially fish canning and preserving, was localised in Kuantan, Mersing, Kota Tinggi, Penang N.E., Larut/ Matang and Kinta districts. These activities operated at two levels, the capital-intensive large scale and the small scale. Another activity, animal feed production was highly capital intensive and production was geared to the national market. Production was confined to twelve districts.

The pulp, paper, plywood and veneer group of manufacturing units, with predominant foreign interests were located in districts with state capitals and the major urban centres. West coast location enabled the industry to combine a market location with centrality to resource areas of the west coast and the central state of West Malaysia, Pahang and close proximity to the ports for export purposes. This industry also reflected some inter-industry linkage; supplying packaging materials and construction materials. It further emphasised the linkage between industry and the land-based resources.

Consumer industry, the third industrial category was the single largest group. It was widely distributed and had fifty-seven different activities with a varying range of dispersion and importance to the district's manufacturing sector.

Taken collectively all the manufacturing activities classified as consumer industry were concentrated in districts with an industrial diversity of 100 and more and 61 to 85. Its contribution to the total number of industrial establishments decreased steadily in districts with a diversity of 12 and below. But even so, in these districts it was second in importance to elementary resource-based industry with a maximum contribution of a third in some districts (Table 3.12, column 3).

Production in consumer industry was undertaken in both large and small establishments. Small scale operations were predominant. They were a characteristic of both industrially high and low ranking districts. As a consequence, the more industrialised a district the larger the number of such units.

Within this section of industry it is important to summarise the distribution of the major industrial activities (Appendix A3.9). Food industry formed an important segment of this group. Establishments were both labour- and capital- intensive, small and large. The two scales of operations were co-existent spatially, although in the industrially low ranking districts the former prevailed exclusively.

The most widely dispersed food activity was the bakery. Establishments were recorded in sixty-four districts and the establishments serving the more industrialised districts increased in number reflecting the small scale of operations. A few large plants with probably a wider market also operated in the industrially high ranking districts.

Other food activities such as biscuit making, ice cream, dairy products, cocoa and chocolate were less widespread. Production was confined to medium size plants and aimed at the national market. Exceptions were some biscuit and ice-cream plants which were non-factory size operations probably with a localised market. Mee Hoon (noodles) and related products were predominantly non-factory operations with more plants in the Chinese populated districts. Ice factories were also small scale operations.

Beverages formed the second component of consumer industry. Soft drinks and carbonated beverages were the only activities which were dispersed. Breweries and spirit distilleries were localised in five districts and competed with one another for the West Malaysian market.

In tobacco production small establishments were dispersed but the bulk of the sales and value added according to the census, was in the hands of the large, capital intensive, centrally located units in Kuala Lumpur, Kinta and Johore Bahru.

Textile production although labour-intensive was dominated by medium sized establishments. Production took place in 17 districts. Its production in Batu Pahat, Johore Bahru, districts in Penang, Kota Bahru and Kuala Lumpur was closely related to labour surplus and market-oriented locations. The apparel factories and made-up textile activities were, however, more dispersed, being in operation in 33 districts. This industry was the strong-hold of the small and family-operated estab-

lishments with a large number of such operations clustered in the urbanised and industrialised districts.

Manufacture of furniture and furnishings was highly decentralised (operating in 57 districts) reflecting variations in style and distance decay impact of transport costs on the spatial extent of the markets of small units.

Office and commercial forms of furniture and manufacture of mattresses, however, was localised and confined to a few large establishments.

Printing and publishing was another subcategory of consumer industry. Within this subcategory, job printing and binding were dispersed but art engraving, printing and publishing took place in 12 districts.

Lastly, manufacture of rubber footwear, re-treading and vulcanising of tyres, repair of tubes, manufacture of matches, perfumes, cosmetics, manufacture of candles and joss sticks was restricted to 18 districts with a higher industrial diversity. Production of brooms and brushes was confined to 9 districts with the State capitals.

Intermediate industry when compared with consumer and elementary resource-based industry was very small. It constituted only 7 percent of all industrial establishments in West Malaysia, reflecting the secondary nature of West Malaysian industry. It was also highly localised within the industrially diversified and urbanised districts (Table 3.12 column 4). The number of establishments declined sharply from a maximum of 173 in the districts with an industrial diversity of 100+ to

those with a diversity of 85 to 61. It was unimportant in the lower forty districts of West Malaysia.

The industrial activities within this group can be grouped into rubber products, chemical products, clay and glass products.

Manufacture of rubber products was undertaken in 35 districts in medium and large establishments which were capital intensive. Chemical production such as liquified gas, industrial chemicals, fertilizers, paints, varnishes and lacquer were also capital intensive and their propensity to create employment was low. They were confined to the 10 industrialised districts. Production of plastics was, however, dispersed. Soap, washing and cleaning compounds, medicines and pharmaceutical preparations were highly localised with production geared to the national market. But herb grinding which was associated with traditional practices was dispersed.

Petroleum refining and production of petroleum products which accounted for a substantial percentage of the value added in intermediate industry was highly localised in the Port Dickson district.

Production of structural clay products such as pottery and china were dispersed, so was manufacture of bricks, tiles and clay products. The low cost of raw materials, bulkiness of final produce gave rise to a large number of small establishments distributed over 39 districts.

Manufacture of hydraulic cement and glass products, however, was localised within a few districts. The Process was capital-intensive and production was confined to districts with limestone.

Capital goods industry accounted for 26 percent of the industrial establishment. It consisted of two significant but totally different types of activities though they complemented each other. One type consisted of service industry such as repair and servicing of machinery and equipment, electrical repair, repair of precision goods and optical equipment. This form of the manufacturing industry was spread out over 50 districts. It was characterised by small, non-factory size establishments operated with the help of part-time labour or family labour and just a few full-time paid workers. It was essentially a service rather than a manufacturing activity. The dispersed nature of this activity explained the occurrence of a high percentage of establishments categorised as capital goods industry in the districts with an industrial diversity of 24 and below. (Table 3.12 column 5) Nevertheless, this activity was not confined to the lower order of districts but on the contrary, the number of establishments serving the industrially diversified districts increase without change in form or size. The only difference was that in these districts a few large establishments also performed similar functions.

The second form of capital goods industry included primary iron and steel manufacturing, foundries,

basic metal product industry, machinery, electrical goods and components manufacture and manufacturing and assembling of transport equipment. These activities were associated with the more industrialised districts.

The most widespread in this category was the metal products manufacture. It was found in 64 districts. The scale of operations ranged from small to a few large, capital-intensive units. Primary iron and steel milling was highly localised in the districts of Bukit Mertajam and Kuala Lumpur while basic metal products manufacture occurred in 17 districts.

Machinery, equipment and electrical equipment consisted of assembly of imported parts. Plants were localised in the industrialised districts and operated on capital-intensive techniques.

In shipbuilding, boat building and repair, the former was non-existent but the latter was a small scale operation undertaken by fishermen involved in inland fishing. Districts of Kota Tinggi, Mersing, Batu Pahat, Kota Star, Kota Bahru, Malacca Central, Kuantan, Penang N.E. and Dindings were examples in point. The precision goods industry was confined to the four urbanised districts.

3.5 Combining the different measures of industrialization

The discussion so far on spatial distribution and structure of the manufacturing industry was centred on several components such as the number of establishments, the range of industrial activities, employment and value added in manufacturing. As all these variables are conceptually and functionally related and in essence represent

different facets of the manufacturing sector, a comparison of the districts on all four separate components would provide a useful guide to the collective impact of the underlying forces.

Table 3.13 shows that the ranking of districts in terms of the number of establishments was a fairly deceptive measure of the level of industrialization or the dispersion of the manufacturing industry. This was particularly true of the rural and agricultural districts where industrial units were extremely small, operated and financed by local entrepreneurs who had limited financial resources. Furthermore, as the market area served by these units was restricted by transport costs and the bulkiness of the agricultural commodities, a large number of small units emerged but generally, the range of activities, the employment created and the value added was low, thus causing a drop in the ranking of these districts on other variables. Muar, Kuala Trengganu, Kubang Pasu, Krian, Batang Padang, Perlis, Kuala Pilah, Besut and Kuala Langat were examples in point.

Ranking of districts on the mean score of the component ranks indicate, explicitly, the impact of two forces. Within the first twenty-one ranks, which in fact constituted the more significant industrial sites, were classified the ten districts with the State capitals or major urban centres. The first four ranks were occupied by districts with the four largest urban centres in 1968. They were followed in the 7th, 8th, 12th, 13th, 17th and 21st positions by other State capitals. The remaining ranks

Table 3.15. THE RANK OF DISTRICTS BASED ON THEIR MEAN RANKS ON FOUR INDICATORS: NUMBER OF ESTABLISHMENTS, RANGE OF INDUSTRIAL ACTIVITY, FULL-TIME PAID EMPLOYMENT AND VALUE ADDED IN MANUFACTURING, 1968.

District	No. of Estbs.	Activity Range	Full-time paid Employment	Value Added	Mean Rank of 4 Indicators
Kuala Lumpur	1	1	1	1	1
Kinta	2	3	3	2	2
Penang N.E.	3	2	5	8	4
Johore Bahru	4	4	2	3	3
Malacca Central	5	6	11	11	7
Kota Star	6	16.5	14	19	13
Butterworth	7	5	6	7	6
Seremban	8	8	8	10	8
Klang	9	7	4	5	5
Batu Pahat	10	11	12	12	10
Muar	11	12	18	22	16
Kota Bahru	12	14	9	14	12
Larut/Matang	13	9	10	15	11
Kuala Trengganu	14	19	26	34	21
Kuala Muda	15	13	15	18	15
Lower Perak	16	16.5	19	25	18
Bukit Mertajam	17	10	7	6	9
Kuala Kangsar	18	20.5	29	30	23
Kluang	19	15	13	9	14
Kuantan	20	18	17	20	17
Kubang Pasu	21	40	37	38	35
Krian	22	29.5	32	46	32
Batang Padang	23	23.7	35	37	29
Dindings	24	27	24	16	20
Segamat	25	25.7	23	23	22
Termeloh	26	35	22	21	26
Perlis	27	37	39	41	37
Nibong Tebal	28	26	21	24	25
Kulim	29.5	23.7	27	35	28
Kuala Pilah	29.5	29.5	44	45	38
Ulu Langat	31	22	33	33	30
Ulu Selangor	32	28	25	13	24
Pontian	33	20.5	16	17	19
Bentong	34	33.5	28	27	31
Kuala Langat	35	33.5	52	48	42
Raub	36	36	31	29	33
Kuala Selangor	37	31.5	38	28	34
Besut	38	55.8	53	58	51
Baling	39	47	42	44	43
Alor Gajah	40	31.5	40	26	36
Pasir Puteh	41	55.8	57	60	55
Pasir Mas	42.5	50.7	48	53	49
Port Dickson	42.5	39	20	4	27
Tumpat	44	50.7	56	56	53
Tampin	45	38	43	39	40
Jerantut	46.7	53	34	32	41
Lipis	46.7	50.7	47	51	50
Jasin	46.7	43.5	49	49	48
Sabah Bernam	49	41.5	50	36	44
Upper Perak	50	45.5	55	55	52
Pekan	51	47.7	58	54	54
Kota Tinggi	52	43.5	45	40	46
Mersing	53	41.5	30	31	39
Dungun	54.5	45.5	36	43	45
Kemaman	54.5	47.7	41	42	47
Ulu Trengganu	56	65.7	61	64	61
Ulu Kelantan	57.5	54	54	57	57
Yen	57.5	55.8	63	52	59
Machang	59	55.8	67	66	62
Bachok	60.7	68.5	59	63	63
Langkawi	60.7	55.8	60	61	60
Bandar Bahru	60.7	61.7	65.5	67	64
Rembau	63	55.8	46	50	56
Jelebu	64	61.7	51	47	58
Tanah Merah	65.5	61.7	68	68	68
Marang	65.5	68.5	62	62	66
Sik	67	64.7	64	59	65
Penang S.W.	68	61.7	65.5	65	67
Cameron Highlands	69	65.7	69	69	69
Padang Terap	70	70	70	70	70

were occupied by districts with medium size towns and industrial estates that had succeeded in attracting industrialists. But the close proximity of these districts to the first four ranked districts was an important feature. The remaining districts of Batu Pahat, Muar, Kuala Muda and Lower Perak functioned as regional sub-centres within the developed West Coast.

With the exception of Kota Bahru, Kuala Trengganu and Kuantan - all of them districts with State capitals - no other east coast district appeared within the first twenty-one ranks.

3.6 An Evaluation of the Patterns

An analysis of the sectoral structure of the economy from 1957 to 1968 indicated that the change from export-dominated primary producing economy to a diversified one with a manufacturing bias had been achieved in the initial phase of industrial development. Thus, the main objective of the policy of industrialization was achieved.

The structural pattern of manufacturing industry, however, revealed that this change was brought about through a process of import substitution. By this is meant substituting domestic production for imported manufactures especially of consumer non-durable goods. This conclusion is substantiated not only by the fact that 46 percent of the manufacturing establishments produced consumer non-durable products but from its contribution to value added in manufacturing (Table 3.14). The nascent

Table 3.14 CONTRIBUTION OF MAJOR INDUSTRY GROUPS TO VALUE ADDED IN MANUFACTURING 1968

	Amount	% of Total
Elementary Resource-based Industry	174,579	19.98
Advanced Resource-based Industry	58,055	6.64
Consumer Industry	289,644	33.15
Intermediate Industry	213,081	24.38
Capital Goods Industry	138,492	15.85
Total	873,851	100.00

Compiled from Census of Manufacturing Industries, West Malaysia, P. 18 - 27.

stage of development of advanced resource-based industry and intermediate industry also proved this point.

This line of action was prompted by many factors to which reference had been made in the last chapter. Import substitution was possible because the market for consumer goods was available and it was satisfied in the past by imports. A change from imports to home production was thus based on the existing pattern of demand.[1]

Secondly, industrialization in the first phase depended heavily on imports of capital goods and the necessity to import capital goods compelled the curtailment of the imports of consumer non-durables. The pressure to curtail these imports was imposed by the decline in the export earnings of primary export commodities due to the unfavourable terms of trade of primary products in comparison to manufactured goods. The inevitable association of growth and import substitution and the need to reduce the pressure on the balance of payments was thus examplified by the West Malaysian situation.[2]

Within the broad context of import-substitution, however, the rapid growth achieved was not spread out evenly over the entire group of industries. Some groups which had attracted the attention of investors under the pioneer industries legislation showed up predominantly as

---

1. Maizels, A., Growth and Trade, NIESR Students' Edition, Cambridge University Press, 1970, p. 68.

2. Clark, P.B., Planning Import Substitution. Op.cit., P. 15-21.

segments of industry displaying rapid growth between 1963 and 1968.[1] Table 3.15 shows the comparative growth indices of some industries between 1963 and 1968. The petroleum industry, textiles, basic metal industries and electrical machinery all showed high growth rates. Transport equipment also illustrated the growth of vehicle assembly, reflecting official encouragement under pioneer industries legislation.

Other major groups that showed high growth rates as well as enjoyed tax advantages included rubber industries, particularly tyre manufacture and non-metallic mineral industry such as cement.

Thus it is evident that growth has been achieved in those industrial activities which were "invaded" by large-scale enterprises, drawing some benefits from industrial policy measures.[2]

The failure of manufacturing industry to match its employment creating ability with its growth performance has been discussed. The widening gap between the increase in value added in manufacturing and its contribution to employment can be attributed to the weaknesses of the financial incentives offered by the Government. Since a minimum investment of only $100,000 was required to qualify for the tax concessions, manufacturers tended to use capital-intensive techniques, thus, reducing the labour generating ability of industry.

---

1. Mctaggart, W.D., Industrialization in West Malaysia, 1968, op.cit., P. 15 & 16.

2. He also noted that "virtually the totality of the petroleum refining industry had pioneer status, 89 percent of the value added by the textile industry was derived from establishments with pioneer status; 71 percent in basic metals, 72% in electrical machinery, 51 percent in beverages and 47 percent in food processing. Ibid., p. 22.

Table 3.I5 GROWTH INDEX OF DIFFERENT INDUSTRIES BETWEEN I963 AND I968

Industry	Growth Index
Rubber remilling	I.534
Rubber smokehouses	I.9I0
Coconut Mills	I.8I6
Copra Kilns	NA
Tea processing	0.938
Food Manufacture	
Meat Canning	
Ice cream and dairy products	3.855
Pineapple canning	NA
Pickle manufacture	I.629
Blachan manufacture	0.607
Seafood canning	NA
Small rice mills	I.344
Rice flour mills	NA
Large rice mills	0.633
Other grain mills	33.876
Biscuits	I.2I3
Bakeries	I.I95
Cocoa , chocolates	2.43I
Meehoon ,noodles	I.03I
Spices, curry powder	I.340
Soyabean products	0.709
Coffee Factories	I.232
Ice factories	I.28I
Animal Feeds	2.843
Other food industries	NA
Beverages Manufacture	
Distilling	2.588
Brewing	NA
Soft Drinks	I.298
Tobacco	2.020
Textiles	4.833
Footwear(not rubber)and made up textiles	
Footwear	I.04I
Clogs	0.680
Footwear repair	NA
Made-up-textiles	3.077
Hats, songkoks	NA
Wood and Rattan goods(not Furniture)	
Sawmills, Plywood mills	2.000
Joinery mills	I.I77
Timber preservation	NA
Prefabricated buildings	NA
Rattan Products	NA
Wooden boxes	I.585
Carpentry shops	I.287
Coffin manufacture	0.857
Cooperage	NA
Furniture and Fixtures	
Wood furniture, rattan furnit.	NA
Metal furniture	I.294
Mattress Making	NA
Furniture, furnishings+repair	NA
Paper and Paper products	
Pulp, paper	NA
Paper boxes	2.020
Paper ceremonial goods	NA
Paper articles nec.	NA
Printing and publishing	I.794
Leather goods	I.494
Rubber products	
Rubber goods and tyres	I.494
Tyre rethreading	I.480
Chemical Products	
Compressed gas	NA
Industrial chemicals	NA
Fertilizers	NA
Refined cocoanut oil	I.39I
Vegetable + animal fat	NA
Paints and Varnishes	2.I99
Soap manufacture	I.490
Pharmaceuticals	I.734
Perfumes and cosmetics	I.2I3
Candles, joss sticks	NA
Ot her chemicals	NA
Petroleum products	NA
Non- metallic mineral products	
Structural clay products	I.280
Glass making	4.5I2
Pottery	I.3I2
Cement	NA
Structural cement products	NA
Cut stone	NA
Other metallic minerals	NA
Basic Metal industries	
Iron foundries	2.305
Iron and Steel shapes, Other basic metal products	6.9I5
Metal Products	
Fabricated structural shapes	NA
Architectural metal products	I.986
Wire and wire products	I.868
Hardware and tools	0.786
Boilers, platework	NA
Tin cans	2.I92
Brass, pewter	2.097
Tin smithing	I.025
Stamped metal	NA
Blacksmithing	2.II7
Other metal products	NA
Machinery(not electric)	
Industrial machinery	I.660
General engineering	I.653
Air conditioning equipment, Other machinery nec.	2.037
Electrical Machinery	
Batteries, Electrical appliances, Electrical repair	4.4I9
Transport Equipment	
Shipbuilding, Marine Engins	0.578
Vehicle Bodies	I.095
Vehicle Assembly	NA
Vehicle parts	2.409
Bikes + trishaws	2.609
Motor cycles	NA
Miscellaneous Manufactures	
Plastics nec.	4.52I
Surgical goods	NA
Other miscellaneous industry	NA

NA: Not available. It refers to industry was non-existent in I963 or not listed seperately owing to the small scale of the operation.

Source: Extracted from Metaggart, Op. cit.,Table 2 p.I8,I9.

Note: Overall rate of growth of value added represents a growth of just over 2.

An analysis of pioneer industry helps to substantiate this argument. Table 3.16 shows that in 1968, 146 pioneer industries were in operation. Collectively they accounted for 50.4 percent of the fixed capital invested in industry in 1968, but fifteen of them had a fixed capital amounting to $200,000 each, another 39 invested between $200,000 to $1 million each, and 56 recorded an investment of less than $5 million each. Only 36 establishments belonged to the over $5 million category. This clearly shows the small amounts of capital invested by pioneer industry.

In terms of employment, collectively, the pioneer industry accounted for 18.8 percent of the employment in the manufacturing sector in 1968, far below their contributions to value added of 32 percent and to capital of 50,4 percent.

Apart from the reasons already discussed for the low employment contribution, the industry product-mix can be considered a contributory factor. Import substitution was undertaken by foreign-owned and foreign-controlled establishments some of whom were formerly active importers of manufactured products. They adopted a technology which was developed in the industrialised countries where the factor endowment is different from that of a developing country like Malaysia. This statement could be qualified to accommodate certain industry types like the petroleum industry which demands a high capital: labour ratio to operate.

The failure to: a) guide industry to maximise the use of the resources available within the country,

Table 3.16 STATISTICS ON PIONEER INDUSTRIES 1963 AND 1968

	No. of Establishments	Value Added $(000)	Full-time paid Employment	Sales $(000)	Value of Fixed Assets $ (000)
1963	85	72,328	7042	195424	449027
1968	146	278,274	22652	895126	N.A.
Rate of Increase 1963-1968	1.7	3.9	3.2	4.6	N.A.
% of the 1963 manufacturing sector	0.96	17.21	8.70	11.57	N.A.
% of the 1968 manufacturing sector	1.62	31.84	18.75	29.08	50.40

N.A. Not Available

Source: Compiled from the Census of Manufacturing 1963, 1968.

b) draw up priorities among the objectives of an industrial policy, c) work out a regional industrial development policy, contributed to the weaknesses in the initial phase of industrial growth. Certainly the assumption that rapid industrial growth would automatically produce a pattern which would be spatially and structurally favourable to the country was a misconception on the part of planners. The responsibility of what to produce and where to produce was vested in the hands of the private investors. It was left to their ingenuity to gauge the extent of the market for their products. No attempt was made to estimate the extent of the domestic market for the different products or to draw up a list of priority products to meet areas of shortages. These weaknesses together with the enthusiasm to achieve rapid growth, manifested themselves in the pattern of industrialization.

It was characterised by a large number of establishments in the same activities. The mushrooming of factories of small and very small size in areas of greater industrial diversity, rather than, as would be expected, a change to a few large establishments to take advantage of economies of scale became pronounced.

The problem of duplication of industrial units with direct competition among them also arose because siting of factories was the responsibility of the individual State Governments. Decisions within each State were made by the State assembly and the executive committee. As such, States were competing with one another to diversify their respective economies by attracting industrialists. The move to set up

the Federal Industrial Development Authority, towards the end of the initial period, to co-ordinate industrial development testifies to the existence of this problem. The dependence of import substitutes on a domestic market further compounded the problem.

The weaknesses in the pattern also reflect the effect of the duration of incentives offered. The maximum period of tax exemption was five years. It thus tended to encourage small units with short term plans rather than large manufacturing establishments with long term plans.

Furthermore, since all States were competing for industrial projects the industrial incentives were applicable indiscriminately. The net result was that industry tended to polarise into districts with advanced infrastructural facilities, financial and institutional services, thus, aggravating existing regional disparities.

3.7 The Investment Incentives Act of 1968

During the period under consideration the problems outlined were not seen in the perspective given above or perhaps they were regarded lightly with the hope that they would be solved with rapid industrialization. For this reason they are considered in greater detail in the next chapter. However, remedial action to what were regarded as outstanding weaknesses was taken in the form of the Investment Incentives Act of 1968.

This Act led to the revision of the qualifying values for incentives together with an increase in the number of incentives "to induce greater and rapid flow of

investments not only in manufacturing and agricultural-based industry but also in other enterprises to encourage expansion of exports in manufacturing."[1]

The Act is summarised in Table 3.17. It shows that new incentives were basically subdivided into three sets of alternatives. First, were the pioneer status privileges; the procedure for granting pioneer status remained the same but the amount of capital invested to qualify for corresponding period were increased, with less than ₦250,000 as the minimum requirement for a two year period of tax 'holiday' and a maximum of ₦1 million and above for the five year period of tax exemption.

The period of tax 'holiday' could be further extended for a year by fulfilling any of the following conditions: a) establishing a factory in a developing area, b) manufacturing priority products, c) usuage of specific local content of materials.

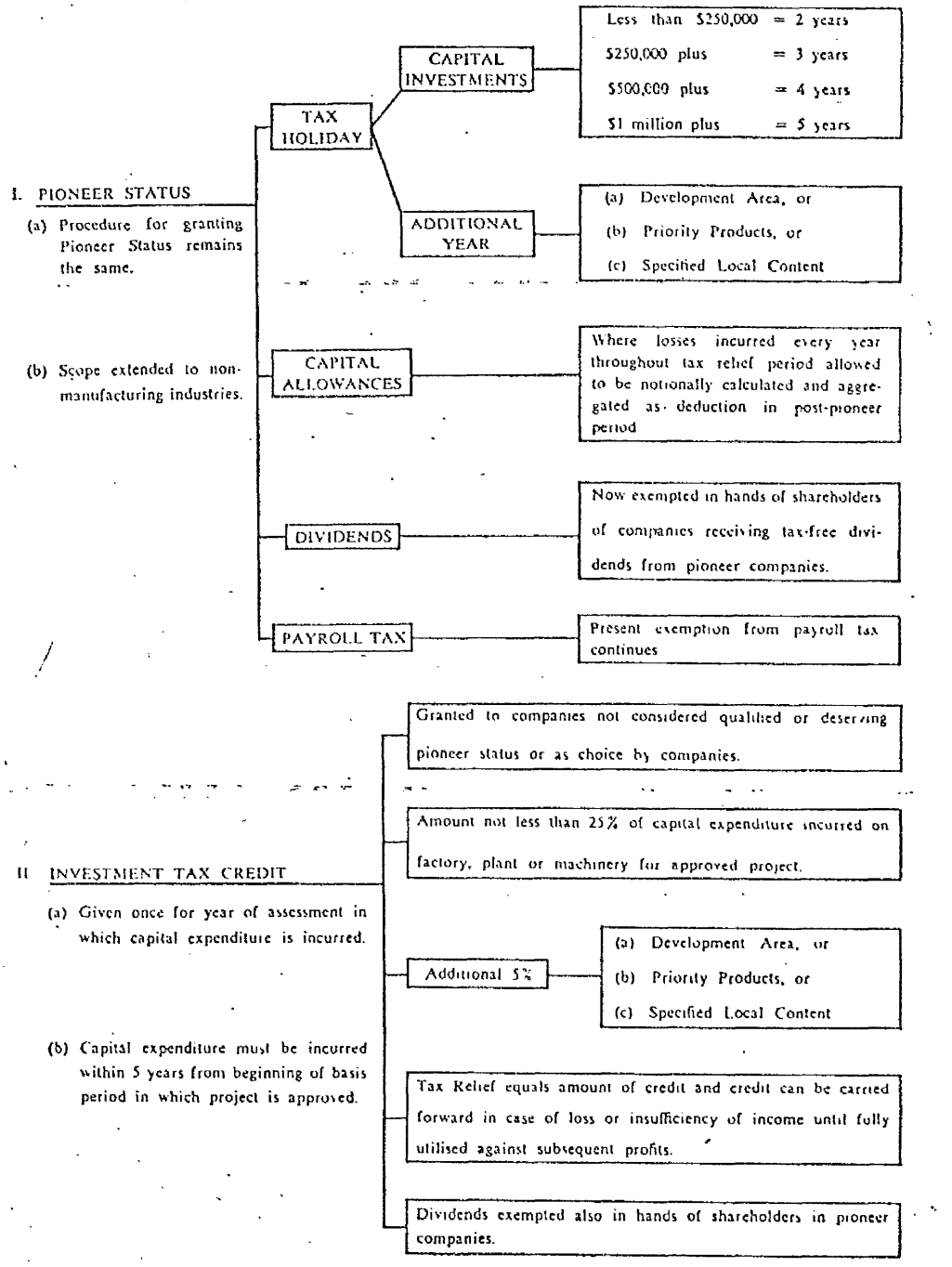
Secondly, Investment Tax Credit was introduced for companies not granted pioneer status. It amounted to 25 percent capital expenditure in the year the capital expenditure was incurred. The capital expenditure had to occur within five years of approval of the project. In addition, an additional 5 percent could be granted if development area, priority project or local content conditions were satisfied.

---

1. Extract from the Speech by the Minister of Commerce and Industry introducing the Investment Incentives Bill 1968 in the House of Representatives on the 29th Feb. 1968. Federal Industrial Development Authority, Investment Incentives Act, 1968, FIDA publication, P.1.

Table 3.17 INVESTMENT INCENTIVES ACT 1968 (Summary)

(Incorporates Amendments made in 1969 and 1971)



Continued Table 3.I7

III. EXPORT INCENTIVES

DEDUCTIONS FOR PROMOTION OVERSEAS

Expenses Qualified

(a) Overseas Advertising.
(b) Supply of free samples overseas.
(c) Export market research.
(d) Preparation for overseas tenders.
(e) Negotiation and conclusion of contracts overseas
(f) Supply of technical information overseas.

ACCELERATED DEPRECIATION ALLOWANCE

- Only resident companies qualified.
- Must export 20% by value.
- Given only in respect of capital expenditure incurred for modernization.
- Rate — 40% per annum.

EXPORT ALLOWANCE

- Non-resident companies and exports of primary commodities excluded.
- Allowance related to increase in
  (a) exports;
  (b) wages paid in respect of employees with less than $500 basic wage per month;
  (c) amount of Malaysian materials used (50% of which by value provided in Malaysia).
- Scheme allows deduction for income tax purposes of 20 cents for every dollar incurred on wages and Malaysian materials used in basic period.
- Formula used:-

$$\frac{(VE) - (AV3)}{GS} \times 20 \text{ cents}$$

VE = value of export sales in basis period.
AV3 = average of export sales for 3 preceding years.
GS = gross sales for basis period.

PAYROLL TAX

- Granted to registered companies exporting more than 20% of the total production of registered products.
- Refund based on the proportion of export turnover to the value of the total turnover of company for the year.

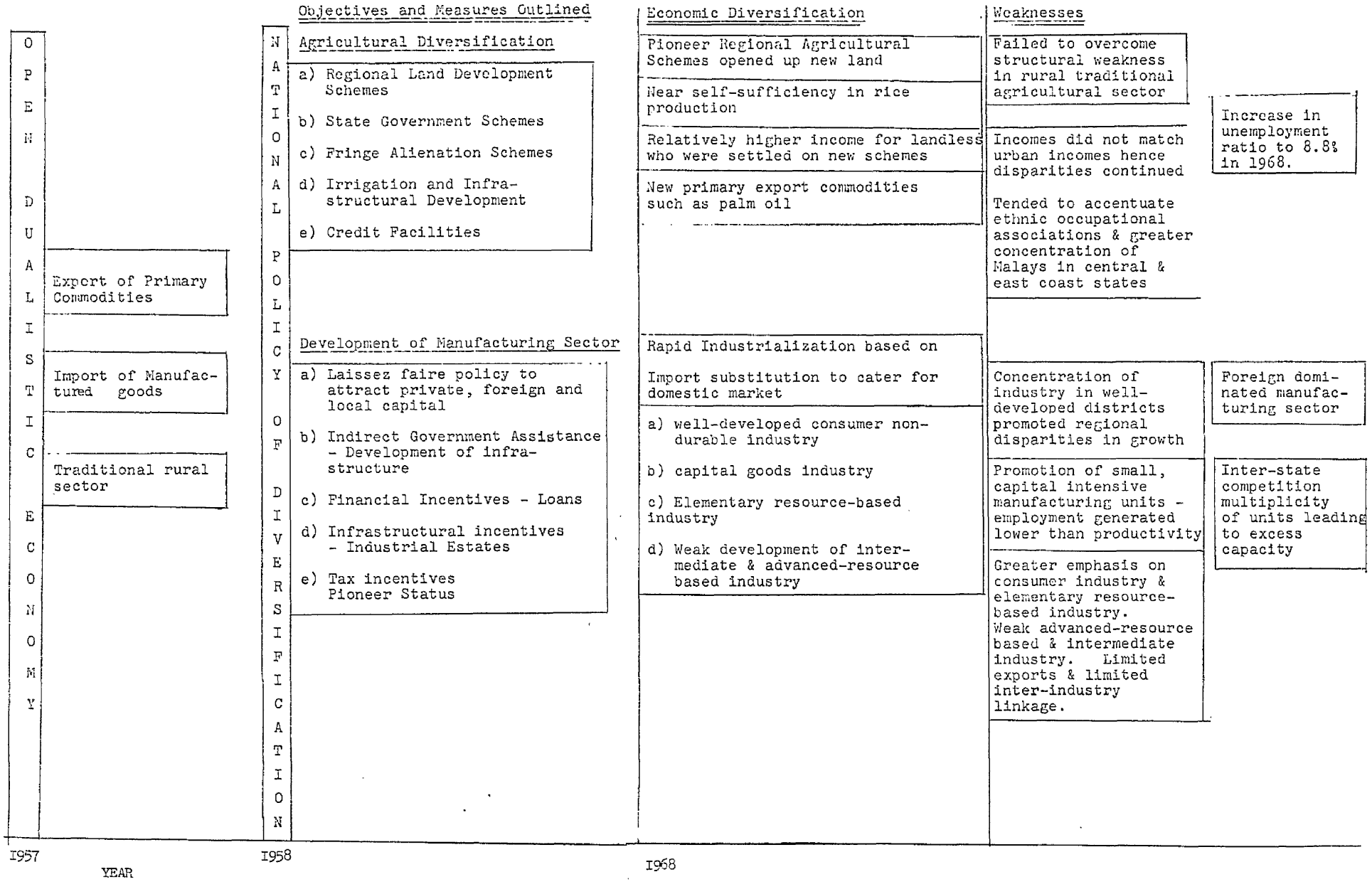
Source: Extracted from Malaysia, FIDA, Investment Incentives Act,1972, p. I3 and I4.

Thirdly, export incentives were introduced by providing such benefits as accelerated depreciation allowances and subsidies for sale promotion abroad if companies exported 20 percent by value of their products.

It is important to emphasise, here, that although the Act did not define "priority projects" and "development area", the Act indicated for the first time an awareness of the need for principles and policy on the type of industry that was desired in the national interest by emphasising Malaysian or local content and the spatial distribution of industry. However, the private investor remained the means of achieving these goals.

The implications of these policy changes and their ability to solve the problems in the economy and those generated by the initial industrial pattern will be considered in the next chapter.

Table 3.18 EVOLUTION OF AN INDUSTRIAL PATTERN AND THE INFLUENCING FACTORS



CHAPTER IV

STRATEGIES FOR INDUSTRIALIZATION UNDER THE NEW ECONOMIC POLICY

Glimpses of the need to give direction to the manufacturing industry on the subject of location and the nature of industries desired in the national interest were seen in the Investment Incentives Act of 1968. This change in policy from the liberal laissez faire attitude of the post-independent period can be interpreted as a counter move against the weaknesses within the spatial and structural patterns of manufacturing industry analysed in the last chapter.

The racial riots of May 1969 made it imperative to reexamine the problems of the Malaysian economy in general and those of the industrial sector as a component of it. Although some of these problems were mentioned in the last chapter an appraisal of the problems is necessary here since the shift in industrial policy was brought about by them.

4.1. The Economic and Social Problems arising from the Growth of the Manufacturing Sector

The first problem that can be identified was the disparity in the spatial distribution of industry. The pattern of industrialization arising from the unguided policy of free enterprise led to the concentration of manufacturing industry in a few districts in the more developed states of the west coast. Naturally this helped to accelerate the

growth of the Klang Valley (which constituted the districts of Kuala Lumpur and Klang), Penang Northeast, Kinta district and Johore Baharu district. But this polarization also helped to accentuate the disparity in regional incomes.

Associated closely with this problem was the second problem which was related to the nature of the industry. It was seen in the last chapter that advanced resource-based industry was still in its infancy. Much of the output from primary products was still exported in the unprocessed or semi-processed form. The bulk of the increase in manufacturing output was based on import substitution in consumer non-durable and capital goods industries. As import substitution depended solely on the domestic market, its propensity to continue expanding was constrained by the limited domestic market. Signs of this appeared in some sectors of manufacturing where a number of small establishments were competing directly with one another while the demand could have been satisfied perhaps more efficiently and cheaply by a few larger factories.[1] The intermediate industry, like the advanced resource-based industry, was poorly developed, reflecting a weak inter-industrial link, and dependence on imports for industrial machinery and equipment required in the production process.

---

1. Wheelright, 'Industrialization in Malaya', in Silcock, T.H. and Fisk, E.K. (eds.) The Political Economy of Independent Malaya. A case study in Development (London: Angus and Robertson Ltd., 1963) P. 113.

Thus the problem at hand was not simply that of increasing the value added in manufacturing but also of bringing about greater backward and forward linkages with their higher multiplier effect. Decisions had to be taken by industrial planners to propagate industry that would use local raw materials in production, and move on into export substitution from import substitution before the latter ran into problems of excess capacity.

A third problem arising from the policy of rapid industrialization based on a liberal flow of foreign capital was that of ownership and equity participation. The country's manufacturing sector was dominated by large establishments and by foreign-owned establishments.

Hirschman, (1971)[1] has shown that establishments with more than a million (Malaysian) dollars worth of sales per year, in 1968, constituted less than 5 per cent of all establishments in West Malaysia. But effectively they accounted for two-thirds of the sales of the manufactured goods in West Malaysia. What was the nature of the ownership of these large establishments, is the pertinent question. The allocation of ownership for each establishment was based on the citizenship of the owners of the majority of the share capital.[2] According to the 1968 Census of

---

1. Hirschman, C. Ownership and Control in the Manufacturing Sector of West Malaysia, United Malayan Banking Corporation (UMBC) Economic Review. Vol.VII No. 1. 1971 p.21-30.

2. West Malaysia, Department of Statistics, Census of Manufacturing Industries, West Malaysia, 1968, P. 13.

Manufacturing, if in a limited company 60 per cent of the capital was held by Malaysians and 40 per cent by British, the ownership would be reported as Malaysian and vice-versa. However in the case of joint ventures where each party held 50 per cent of the capital and in cases where there was no majority holding by any one nationality, the establishments were classified as 'others'.

The participation and dominance of foreign capital was indicated by the value of sales and the value added of companies with different categories of ownership.[1] While ninety-four per cent of the manufacturing establishments were owned by Malaysian citizens, these establishments accounted for 52 per cent of the sales and value added. Singaporeans who formed the next category, owned 3 percent of the establishments but accounted for 14 per cent of the sales. The British ownership amounted to one per cent of all establishments, but controlled 19 per cent of the sales and 21 per cent of the value added in manufacturing. Americans owned 0.2 per cent of the establishments and accounted for 5 per cent of the sales and value added. The Japanese, Dutch and Indians were of lesser importance. Others accounted for 1.2 per cent of the establishments and 8.4 per cent of the sales. Hence, almost half the total production was in the hands of establishments in which majority ownership was foreign. About one-third of the manufacturing production was under the control of overseas-owned (neither Malaysian nor Singaporean) establishments.

---

1. Hirschman, op.cit., p. 24.

The number of companies with 40-49 per cent foreign ownership was not negligible, so that the true level of non-Malaysian ownership was probably even higher than that indicated above.[1] It was also significantly pointed out that the non-Malaysian-owned sector was concentrated in a relatively small number of establishments while the Malaysian sector was spread throughout a very large number of establishments.

Hence, the scheme of classification of ownership of industry used by the Census of Manufacturing in West Malaysia tended to underestimate the exact level of participation by foreign capital in 1968. It would have been more appropriate to measure the percentage ownership of share capital of non-Malaysians in each company to derive the exact participation by foreign investment.

Despite this limitation, it is conclusive that the dominant role played by foreign capital in the commercial, agricultural and mining sectors since the colonial era seems to have extended its influence into the manufacturing sector which developed in the post-independence era. Table 4.1 shows that foreign interests accounted for one-half to three-quarters of the share capital of limited companies in estate agriculture, mining, manufacturing, wholesale trade, banking and finance in 1969. Foreign interests also accounted for more than a third of the share capital of limited companies in retail trade and other industries.[2]

---

1. Hirschman, Op.cit., p. 24.

2. Malaysia, Second Malaysia Plan, 1971-1975, Government Press, Kuala Lumpur, 1971. p. 40 and 41.

TABLE 4.1. OWNERSHIP OF SHARE CAPITAL OF LIMITED COMPANIES IN WEST MALAYSIA, 1969

All Companies incorporated in West Malaysia	All Industries ($000)	All Industries (%)
Residents		
Malays	49294	1.0
Malay Interests	21339	0.5
Chinese	1064795	22.8
Indians	40983	0.9
Federal and State Governments	21430	0.5
Nominee companies	98885	2.1
Other individuals and locally controlled companies	470969	10.1
Foreign controlled companies in Malaysia	282311	6.0*
Non-Residents	1235927	26.4*
West Malaysian branches of companies incorporated abroad Net investment by Head Office	1391607	29.7*
Total	4677540	100.0

*These items show foreign ownership totalling 62.1%

Source: Second Malaysia Plan 1971-75 page 40.

Table 4.1 also shows that of the total share capital of $4,678 million, 62.1 per cent was accounted for by foreign interests compared to 22.8 per cent by Chinese, 1.5 per cent by Malays and 0.9 per cent by Indians.

Although these statistics helped to dispel the popular belief in West Malaysia for a long time that the Chinese own and control a major share of investments in the country, they have also given cause for some alarm. Questions have been raised as to the implications of foreign interests on the political, social and national economic interests. The growing cause for concern was supported by other statistics, that in 1968, 70 per cent of the profits earned by all companies in Malaysia were netted by foreign companies.[1]

Unethical corporate practices have mainly contributed to the rising tide of criticism, and the need to revise the policy on foreign investment. Kanapathy[1] mentioned instances when foreign investors profited immensely long before the project went into operation by charging exhorbitant prices for capital and technology. Sometimes reconditioned second-hand machinery considered technologically obsolete were declared as new and assigned shelf-prices, again resulting in the recovery of a certain amount of investment costs even before commencing production. Ignorance of such malpractices, the desire to industrialise rapidly and the comparative freedom from restrictions were exploited fully by foreign entrepreneurs.[2]

---

1. Kanapathy, V. Foreign Investment in Malaysia: Experience and Prospects. Occasional Paper 6, Institute of Graduate Studies, Nanyang University. Singapore, 1971. p. 3.

2. Op.cit., p. 11.

The most significant disadvantage was the issue of profits. The fact that 70 per cent of the profits earned in Malaysia were by foreign companies, substantiated the theoretical concept that large firms which were usually foreign-owned had an advantage because large organizations can maximise on economies of scale, thus, increasing the rate of profits. It followed, therefore, that this situation would allow greater accumulation of funds for reinvestment and if the argument held true, the rate of reinvestment should be higher for large foreign-owned firms than for small domestic-owned firms. Furthermore, since their mode of production was capital-intensive and since technology is developing at a rapid rate, manufacturing establishments based on this form of production should have maintained a higher rate of reinvestment in new equipment to stay competitive. It was fairly obvious that the policy of free enterprise adopted by the Government was based on these theoretical concepts. The conviction that profits reploughed or reinvested would help to accelerate the nation's economic growth appears to justify this line of action.

The fallacy of these assumptions is indicated in Table 4.2 which tabulates the ratio of net capital expenditure to operating surplus by ownership of manufacturing industries in West Malaysia in 1968.[1] The ratio of net capital expenditure, as a surrogate measure of reinvestment, to operating surplus or profits was about 24 per cent for all manufacturing establishments in 1968. This ratio varied considerably by ownership. Malaysian-owned manufacturing establishments

---

1. Hirschman, Op.cit., p. 30.

TABLE 4.2. RATIO OF NET CAPITAL EXPENDITURE TO OPERATING SURPLUS BY OWNERSHIP OF MANUFACTURING INDUSTRIES IN WEST MALAYSIA, 1968

Ownership	Operating Surplus (000)	Net Captial Expenditure $(000)	Capital Expenditure / Operating Surplus %
Malaysian	290,009	77,228	26.6
Singaporean	81,301	17,646	21.7
British	143,563	19,501	13.5
American	39,733	4,533	11.4
Japanese	4,820	503	10.4
Dutch	946	3,550	375.3
Indians	742	160	21.5
Others	45,788	20,305	44,3
Total	606,902	143,426	23.6

Source: Extracted from Table 7, Hirschman, C. Ownership and Control in the Manufacturing Sector of West Malaysia, Op.cit., p. 30.

had a reinvestment rate of 26 per cent while Singapore-owned establishments had a reinvestment rate of 21 per cent. The comparable rates for British, American and Japanese establishments were much lower at 13, 11 and 10 per cent respectively. The high rate of reinvestment by manufacturing establishments in the 'other' category reflect that multiple ownership is more conducive to a business philosophy of reinvestment and expansion than dominant foreign ownership.[1]

The reports of the Financial Survey of Limited Companies analysed by Hirschman[2] support the conclusion that foreign-owned industries were less interested in reinvestment and expansion than locally-owned industries. Hence, with the growing tide of economic nationalism, the policy of free enterprise as a means of achieving stable economic development had to be carefully reconsidered. The geographical concentration of large and foreign-owned firms in the three leading districts of Kuala Lumpur, Klang and Johore Bahru further emphasised the fact that foreign-owned manufacturing units could not be relied upon to redress regional inequalities or tackle the social aspects of development.

The fourth problem which was in some ways related to the previous problem concerns the extent of Bumiputra (Malay) participation in manufacturing. In West Malaysia, the Malays constitute 51 per cent of the total population of 10.8 million (1970). Their participation in the ownership

---

1. Op.cit., p. 26.

2. Analysis of the Financial Survey of Limited Companies in Malaysia showed the net reinvestment in 1967 to profits in 1966. The rates of reinvestment for the two categories of foreign companies were 4.9 per cent and 11.6 per cent, while for locally-controlled companies it was 142 per cent. See Hirschman, op.cit., Table 7, p.30.

of assets was negligible (Table 4.3). In the industrial corporate sector, they owned only 0.9 per cent of the assets, while in the non-corporate sector their share was 2.3 per cent. In contrast, the Chinese who constitute 36 per cent of the population owned 26 per cent of the industrial corporate assets. Foreigners owned 57.2 per cent.

The imbalances in ownership by various ethnic groups in West Malaysia were reflected by the ethnic composition of employment in manufacturing and other sectors. Data were not available for the year 1968, but data taken from 1970 proved this point. In 1970, 65 per cent of the employees in the manufacturing sector were Chinese, 25 per cent were Malay and 8 per cent were Indian. This situation was the reverse of the ethnic composition of the population. Furthermore, the Malay workforce in the manufacturing sector was concentrated in agricultural processing, wood products manufacture and textile industry. These were manufacturing activities where incomes per worker were lower than in industries such as chemical products manufacture, petroleum, basic metal and metal products and machinery. In the latter categories of industries, Malay participation was very small.[1]

The fifth set of problems were concerned with the inadequate employment opportunities for the rapidly growing population. Reference was made in the last chapter to the weaknesses in the system of incentives and taxation as contributary factors to the slower growth of employment in

---

1. Malaysia, Mid-term Review of the Second Malaysia Plan. Government Press, Kuala Lumpur, 1973. p.10.

Table 4.3. OWNERSHIP OF ASSETS IN MODERN AGRICULTURE AND INDUSTRY, PENINSULA MALAYSIA, 1970

Ownership	Modern Agriculture Planted Acreage				Industry (fixed assets)			
	Corporate Sector		Non-corporate Sector		Corporate Sector		Non-corporate Sector	
	(000) acres	%	(000) acres	%	$ million	%	$ million	%
Malaysians	515.0	29.2	697.6	94.1	559.7	42.8	167.2	97.6
Malays	5.0	0.3	349.3	47.1	11.2	0.9	3.9	2.3
Chinese	457.0	25.9	243.3	32.8	342.3	26.2	158.0	92.2
Indians	4.9	0.3	74.8	10.1	1.5	0.1	3.9	2.3
Others	48.1	2.7	13.2	1.8	187.2	14.3	1.4	0.8
Government	-	-	17.0	2.3	17.5	1.3	-	-
Non Malaysians	1249.6	70.8	44.0	5.9	747.3	57.2	4.1	2.4
Total	1764.6	100.0	741.6	100.0	1307.0	100.0	171.3	100.0
% of total	70.4		29.6		87.4		12.6	

1. Modern Agriculture covers estate acreage, under rubber, oil palm, coconut and tea. Felda is included in this category - under the non-corporate sector. Ownership is in terms of total planted acreage.

2. The industry sector covers manufacturing, construction and mining. Ownership is in terms of fixed assets. Total excludes unallocated assets amounting to $25.2 million.

3. Government ownership of 17,000 acres in modern agriculture is included in the non-corporate sector, while its ownership of $17.5 million of fixed assets in industry is included in the corporate sector.

Source: Mid-Term Review of Second Malaysian Plan 1971-1975. Table 1-4, p. 12.

manufacturing. This problem was compounded by the problem of an insufficient supply of skilled manpower. Data on employment showed that British and American companies used a much smaller component of labour relative to their share of value added in manufacturing in 1968[1] reflecting more capital-intensive types of operations and a line of action similar to the factor endowment of their home countries. While this policy helped to overcome the shortages of skills, it failed to solve the problem of a surplus of unskilled labour force.

Political instability in 1969 brought to the forefront the weaknesses of placing the responsibility of choice of industry and its spatial distribution solely in the hands of private investors. While this strategy of industrial development had led to rapid economic development and placed West Malaysia in the top rank as a favourable site for foreign private investment, it accentuated existing regional and ethnic inequalities which have severe political overtones especially in a multi-racial society like West Malaysia's.

4.2 The Strategy of the New Economic Policy

With the aim of redressing these weaknesses the passive role of the Government was discarded. In its place a new development strategy was worked out. In this new policy, Tun Abdul Razak, the then Deputy Prime Minister defined the role of Government as follows:-

---

1. Hirschman, Op.cit., p.24.

'The Government will identify feasible projects and mount a promotional drive to mobilise local and foreign capital. The Government will take the initiative in industry and if necessary, will participate in the establishment of industries either by itself or in joint venture with the private sector, both local and foreign. This participation by the Government will enable us to give new direction and influence to employment policies of these industries. It is the Government's intention that the employment structure in these establishments will reflect from top to bottom the multi-racial composition of our country.'[1]

The Government introduced a twenty year perspective plan which outlined the two goals of the New Economic Policy:

i) the eradication of poverty irrespective of race.

ii) the restructuring of the society to correct economic imbalances, so as to reduce and eventually eliminate the identification of race with economic function and location.[2]

The two-pronged New Economic Policy was planned with the over-riding objective of achieving national unity and progress.

The overall strategy of the New Economic Policy in attaining its objective of economic growth and social justice focussed on the following four main components of

---

1. Malaysia: A New Industrial Development Strategy. Federal Industrial Development Authority. July 1969, p.3.

2. Malaysia, Second Malaysia Plan, 1971-1975. Op.cit., p. 1-9.

growth:[1]

i) The expansion of gross national product at the rate of 6.5 per cent a year during the plan period. The per capita income will thus grow at 3.7 per cent annually with the result that an average Malaysian will receive one-fifth more income in 1975 to the value of $1,300 compared to $1,080 in 1970.

ii) The output and employment growth in the agricultural sector through new land development, rural industrialization and modernization of rural areas to enhance the productivity and widen the range of agricultural activities.

iii) The rapid growth of the manufacturing sector as a strategic sector to provide the thrust for overall economic development and employment creation and to stimulate technological advancement in the country.

iv) The enhancement of skills of Malaysians, particularly, the Bumiputras, through education and training, so as to create a Bumiputra commercial and entrepreneurial community.

Within this overall New Economic Policy the share of manufacturing in the gross domestic product and employment over the next twenty year period was expected to be maintained at a very high level. The average growth targets for the manufacturing sector were spelt out as shown in Table 4.4.

---

1. Ibid. P. 43-51.

TABLE 4.4. SHARE OF MANUFACTURING IN GROSS DOMESTIC PRODUCT AND TOTAL EMPLOYMENT, 1971-1990

Period	% Share of Total GDP	Av. Annual Growth Rate %	% Share of Total employment	Average Annual Rate %
1970	13.6		9.6	
		14.0		8.5
1975	18.0		12.2	
		12.8		8.4
1980	23.3		15.4	
		11.5		6.9
1985	28.9		18.5	
		11.0		6.1
1990	35.2		21.7	
1971-1990 Average Annual Growth Rate	-	12.3	-	7.5

Source: Mid-term Review of the Second Malaysia Plan 1971-75. Tables 4-2 and 4-3, P. 73.

Over the 1971 to 1990 period, the average annual growth rate of the manufacturing sector in gross domestic product was projected at the rate of 12.3 per cent. In employment, the growth rate of 7.5 per cent per annum was outlined.

4.3 Policies Defined to achieve the New Objectives on Industrialization

To achieve these new objectives specific policies were drawn up. These directional items on aspects of industrial policy will be discussed here.

i) Policy on Decentralization of Industry

This policy intended to disperse industrial growth from its concentration in the Kuala Lumpur district. It aimed at bringing about an equitable regional distribution by encouraging industry to develop in the lesser developed areas and less developed districts of the more advanced states in the west coast. It also intended to decentralise industry from the west coast to the less developed districts in the east coast through a process of rural industrialization.

While formulating the Second Malaysia Plan, the Government set up a Capital Investment Committee (CIC) in 1969 to review policies in industrial development. The CIC defined the list of 'priority projects'[1] and 'development

---

1. The following manufactured products were defined priority products:

Continued on following page...

area'[1] mentioned earlier in the Investment Incentives Act of 1968. It also specified what constituted the required percentages of local content[2] in manufacturing products for the purposes of the Investment Incentives Act, of 1968.

Footnote 1 continued from previous page:

a) Manufacture of food products (Fruit, vegetable and meat canning)

b) Manufacture of animal foodstuffs (Pineapple waste and bran)

c) Manufacture of wood products (Fibre board, chip board soft board and hard board)

d) Manufacture of toys, wooden, metal, plastic, rubber and textiles.

e) Manufactures from padi husks and straw

f) Manufacture of rubber products (rubberised fabrics, conveyor belts, transmission belts, V-type belts

g) Manufacture of chemicals and chemical products (titanium dioxide)

h) Manufacture of hardware tools (Axes, pliers, screw drivers, spanners, riveting tools)

i) Manufacture of industrial machinery and parts (ball bearings, machine tools, industrial machinery)

j) Manufacture of transport equipment (outboard motors, pleasure crafts)

k) Manufacture of components, accessories, spare parts, supplies, fitting and garage equipment for motor vehicles.

l) Assembly of manufacture of electronic components

m) Manufacture of electrical machinery (telephone switch equipment).

1. Development Area: The States of Kedah, Perlis, Pahang Kelantan, Trengganu, Malacca and the Industrial Estates of Senawang and Kamunting were so defined.

2. Malaysian Content Required in Manufacturing Products: The Manufactured products should incorporate 50 per cent by value of Malaysian raw materials and or parts and components manufactured in Malaysia, excluding wages, salaries and other domestic inputs. Extracted from Malaysia: A New Industrial Development Strategy, FIDA, July 1969, p.8-12.

A wide range of measures were adopted during the Second Malaysia Plan to decentralise industry. First, the direct participation and involvement of the Government in the newly created industrial projects in the "new growth centres" was outlined. This policy was based on the argument that,

"establishment of industrial activity in new growth areas often involves a longer period before profits are earned than private firms are accustomed to. In addition many of the advantages accruing from greater geographical dispersal are often of an indirect and non-financial nature from which private enterprise do not visibly and directly benefit in terms of profit realisation."[1]

As land, forests and minerals are within the jurisdiction of states, rather than the Federal Government, State Economic Development Corporations (SEDC's) were set up and with the assistance of FIDA, industrial estates were created in the individual states. By the end of 1974, in West Malaysia, fifty industrial estates were established and seven others were planned. These are shown in Figure 4.1 and listed in Table 4.5.

Related closely to the development and planning of industrial estates is the establishment of new towns away from the existing urban centres and within the urban-rural fringe. These were aimed at providing social and urban amenities such as housing, shopping and commercial services for the workers and their families. Some of these

---

1. Malaysia, Second Malaysia Plan. Op.cit., p. 7.

Fig: 4.1 INDUSTRIAL ESTATES, FREE TRADE ZONES AND DESIGNATED DEVELOPMENT AREAS — DECEMBER 1974

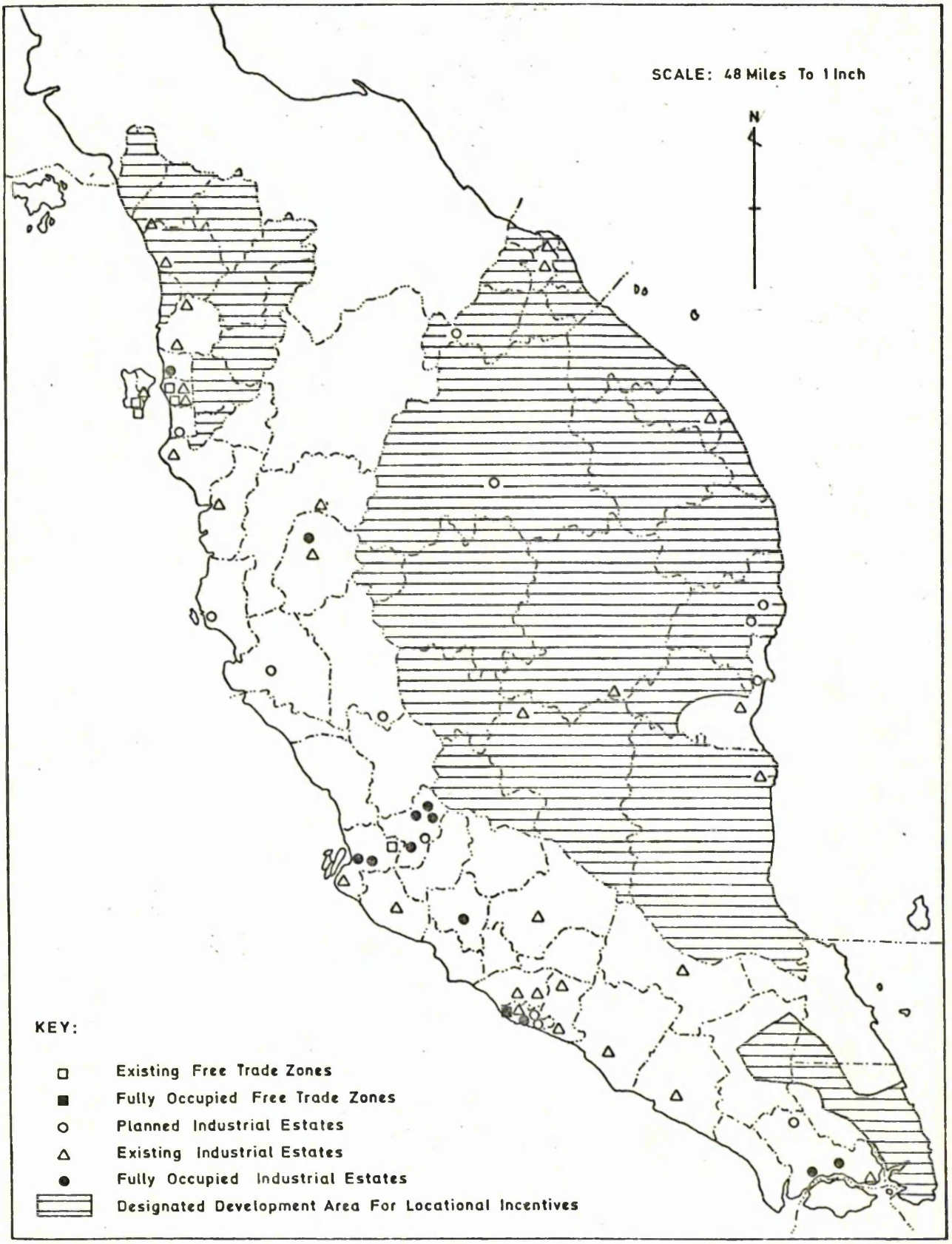


Table 4.5. LIST OF INDUSTRIAL ESTATES IN WEST MALAYSIA WITH PREMIUM, QUIT RENT AND LEASE PERIOD APPLICABLE IN EACH CASE

Industrial Estate	Location (State)	Size (Acres)	Premium (M$ per sq.ft.)	Quit Rent (M$ per acre per annum)	Lease Period (years)
Mergong	Kedah	171	1.00	260	60
Bakar Arang	Kedah	100	0.30 - 0.80	260	60
Tikam Batu*	Kedah	50	0.48	260	60
Mak Mandin**	Penang	320	0.80	695	99
Prai	Penang	2252	0.80	695	60
Prai FTZ	Penang		1.00	870	60
Bagan Serai	Penang	1180	1.00	695	60
Bayan Lepas FTZ	Penang	520	1.30	870	60
Pulau Jerejak	Penang	413	Not yet determined		
Parit Buntar	Perak	300	0.30	3%	60
Kamunting	Perak	714	0.25	3%	99
Kuala Kangsar	Perak	124	0.30	3%	60
Jelapang	Perak	246	0.65	3%	99
Tasek	Perak	370	0.50	120	99
Petaling Jaya**	Selangor	-	1.60	3%	99
Shah Alam*	Selangor	1200	1.00	3%	99
Sungei Way FTZ*	Selangor	103	1.50	3%	99
Pandamaran	Selangor	171	1.50	3%	99
Telok Panglima Garang*	Selangor	100	1.50	3%	99
Ulu Klang FTZ*	Selangor	75	1.50	3%	99
Senawang*	N. Sembilan	285	0.50	$800	99
Kampong Dioh	N. Sembilan	Not yet determined			
Ayer Kroh	Malacca	246	0.85	174.25	99
Tg. Kling FTZ*	Malacca	20	0.85	174.24	99
Batu Berendam FTZ	Malacca	50	0.85	174.24	99
Alor Gajah	Malacca	100	0.85	174.25	99
Tg. Agas	Johore	241	0.60 - 1.00	200 - 400	60
Tongkang Pecah	Johore	27.5	0.60 - 1.00	200 - 400	60
Larkin & Tampoi**	Johore	393	0.40	200 - 400	60
Pasir Gudang	Johore	2649	1.00 - 2.00	200 - 400	60
Pengkalan Chepa	Kelantan	Not yet determined			99
Gong Badak	Trengganu	" "	"		99
Semambu	Pahang	510	Not yet determined		99
Maran	Pahang	34	" " "		99
Peramu	Pahang	340	" " "		99
Songsang	Pahang	154	" " "		99

* Fully Reserved ** Fully Occupied

Source: Extracted from FIDA, Annual Report, 1973. Table XIV Pg. 98.

new towns were sited around existing rural centres to provide a population threshold for the growth of small-scale and resource-based industry. Other towns were planned in conjunction with regional development projects such as the Pahang Tenggara, the Johore Penggerang and Johore Tengah schemes. Forty-seven new towns are in different stages of planning and development in West Malaysia. Their location in relation to the regional development schemes is shown in Figure 4.2. Twenty-nine towns were planned for the Pahang Tenggara region while six were located in Selangor. These towns are listed in Table 4.6.

The SEDC's were encouraged to establish wholly-owned or joint ventures with private interests in a variety of viable manufacturing activities in these new townships or industrial estates.

The Federal Government took steps to help individual states to establish State Economic Planning Units. A Federal committee was established to coordinate the activities of the SEDC's and assist them in the following matters:

1) the provision of financial assistance on reasonable terms;
2) the provision of expertise in marketing assessment and projects identification, preparation and evaluation;
3) the organization of training programmes for State officials; and
4) the coordination of requests for forthcoming technical and material assistance.[1]

---

1. Malaysia, Second Malaysia Plan, Op.cit., p. 115.

Fig: 4.2 REGIONAL AND URBAN DEVELOPMENT SCHEMES AND NEW TOWNSHIPS

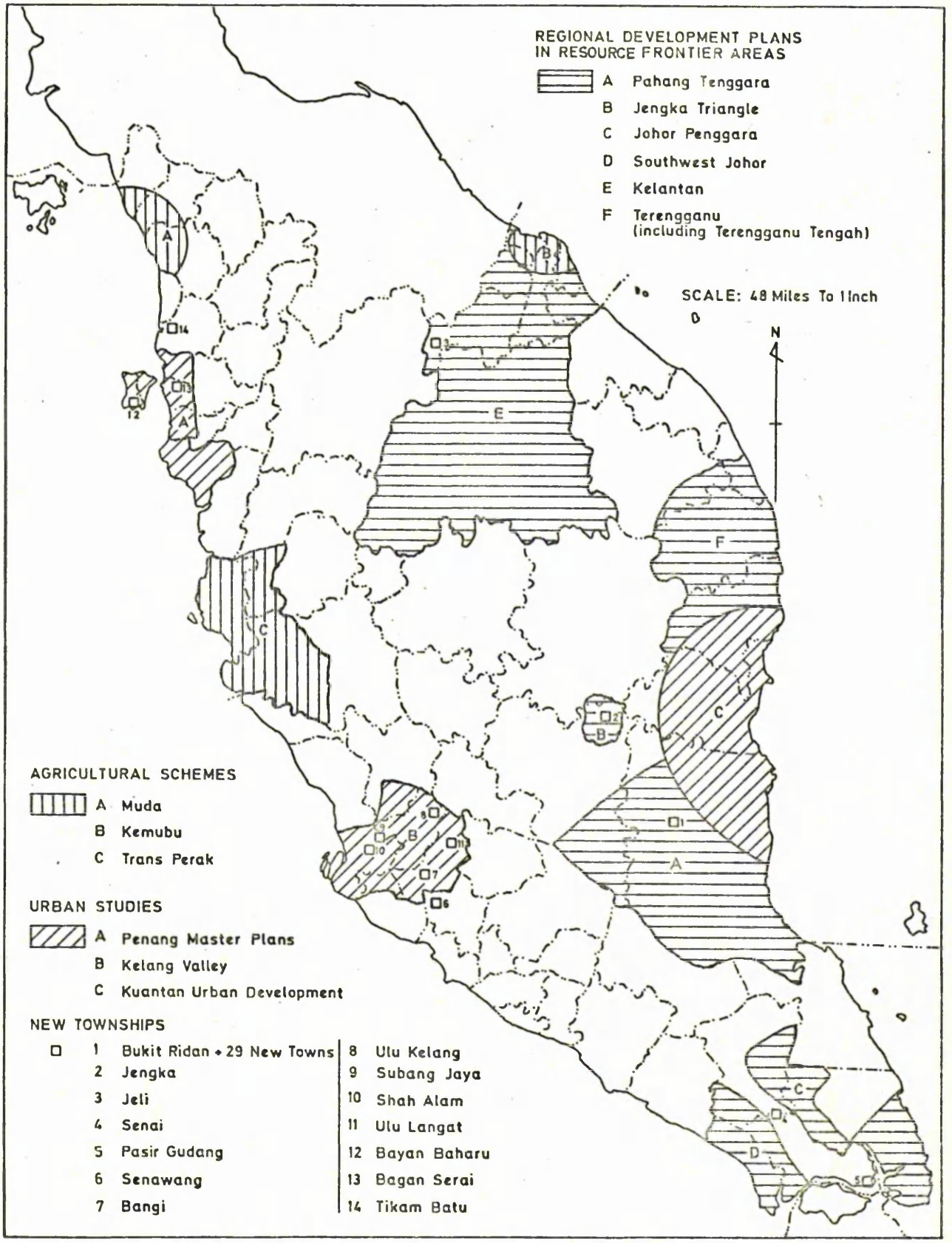


Table 4.6. LIST OF PLANNED NEW TOWNSHIPS IN WEST MALAYSIA

State	Town
Selangor	Kampong Kongo
	Ulu Kelang
	Bangi
	Subang Jaya
	Shah Alam
	Ulu Langat
Pahang	Jengka Town
	29 towns including Bukit Ridan in Pahang Tenggara
Johore	Senai
	1 new town in Johore Penggerang
	Pasir Gudang
Negri Sembilan	Ayer Itam
	Senawang
Penang	Bayan Bahru
	Bagan Serai
Kedah	Tikam Batu
Kelantan	Jeli
	Lebir
Trengganu	1 town in Trengganu Tengah

The aim was to complement the industrial activities of the various states and prevent wasteful competition.

Additional fiscal incentives were provided to attract private investors into the less attractive locations. In 1971, the Government introduced amendments to the Investment Incentives Act, 1968 by incorporating locational incentives for 'development areas'. The provisions were not specific enough so that the Act was revised in 1973 to encourage a rapid dispersal of industry into rural areas. Figure 4.1 shows the areas designated to receive these locational incentives. It covered almost the whole of Kedah (excluding Sungei Patani district), Perlis, Kelantan, Trengganu, Pahang (excluding Kuantan), parts of Johore under the Johore regional schemes. In short, it incorporated all the northern and eastern districts.

The locational incentives offered were a maximum tax relief period of ten years to approved industries located in these designated locational incentive areas. Companies which were granted locational Incentives were allowed an initial tax relief period of five years. The tax relief period could be extended beyond the initial five year period. This extention depended on the amount of new capital invested or the additional employment created by the firm in the year following the termination of the initial period of tax holiday.[1] The relationship between the period of tax holiday and the capital invested or alternatively, the employment created is shown in Table 4.7.

---

1. Malaysia, Industrial Digest, Vol. 7, No. 3. (3rd Quarter of 1974). P. 1.

TABLE 4.7 RELATIONSHIP BETWEEN PERIOD OF TAX EXEMPTION AND QUALIFYING TERMS IN "LOCATIONAL INCENTIVE AREAS" 1973

Period of Tax Exemption	Amount of Fixed Capital Invested	or	Amount of Labour Created
5	Less than $250,000		Less than 101
6	$250,000 to $500,000		101 - 200
7	$500,000 to $1,000,000		201 - 350
8	over $1,000,000		more than 351

Note the period of tax exemption can be extended for an additional year for each of the following conditions:

(1) if the product/industry is a priority product/industry.

(2) if the percentage of Malaysian content attained meets the specified requirements

Extracted from Malaysia Industrial Digest Vol. 7, No.3 (3rd Quarter 1974) P. 1 and P. 10.

Areas designated as locational incentive areas were to be gazetted from time to time so as to ensure that the decentralization measures were effectively implemented.

In addition to these fiscal incentives, premium and quit rents on different sites were made flexible resulting in lower land costs in the 'Development area'. These are listed in Table 4.5.

Rural Industrialization and Regional Planning

To promote industrial activity in less developed States of the east coast and the north, the structure of power, water and transport rates was revised. The Government allocated one-fifth of the allocation of non-security expenditure on the construction of new roads to provide access to new areas of agricultural and mineral resources. The construction of the East-West Highway linking Kota Bahru with Penang, and the construction of the Termeloh Bridge are now underway to provide two arterial links with the west coast states. Two new ports are under construction at Pasir Gudang and Tanjong Gelang. At Pasir Gudang, in Johore a shipyard has been incorporated. This is a joint venture between the Government and a Japanese firm.

Social facilities are being directed to small towns, and the less developed states in the form of banks, hospitals and schools. FIDA has established offices in Kuantan and Alor Star to undertake promotional activities and to provide the services required by investors.

Malaysian Industrial Development Finance Berhad (MIDF) has set up branch offices in Kedah, Kelantan and Perlis to provide credit for rural industries. It utilised the entire $100 million allocated by the Plan in the first three years, approving 265 loans in 1972 and 1973. Three subsidiary companies of MIDF were incorporated between 1970 and 1972 to provide consultancy services. They are MIDF Industrial Consultants Sendirian Berhad (MDFIC), Asian Appraisal (M) Senderian Berhad and Malaysian International Merchants Bankers Berhad. MIEL another of its subsidiary, invested $20.2 million for the building and design of 236 factories for small scale industry up to 1973.[1]

To foster small scale industry especially agro-based plants namely wood industries, credit facilities were extended to small industrialists. The Government established a Credit Guarantee Corporation (CGC) under Bank Negara, the Central Bank, in July 1972. This Corporation provided guarantees up to sixty per cent of the value of loans, with the remainder underwritten by the commercial banks themselves. Up to mid 1973 the CGC had guaranteed a total of 617 loans worth $1.9 million.[2] Bank Pertanian established in 1971 was also involved in the promotion and financing of agro-based industries.

---

1. Malaysia, Mid-Term Review of the Second Malaysia Plan. Op.cit., p. 16.

2. Ibid. P. 144.

To overcome problems related to planning and technical knowhow in small scale industry, agencies such as FIDA, MARA, MIDFIC, NISIR and the National Productivity Centre have set up special units to provide consultancy and advisory services to small scale industry. To ensure effective co-ordination of the services provided by these agencies, an Advisory Council on Consultancy and Advisory Services for Small-scale industries was established in 1973.[1]

In addition to the intensive programme of providing social, infrastructural and credit facilities in the less developed states, to create geographically attractive sites for the location of industries, attempts were made to overcome environmental hazards which to some degree have deterred development in the past in favour of the west coast states. Reference here is being made to flood control measures to prevent losses during the North-East monsoon which occurs from November to February bringing heavy rainfull to the east coast states. The intention is to integrate the flood control scheme with the drainage and irrigation projects.

Shortage of skilled labour is another problem which industrial promotion measures were designed to tackle. The measures hoped to achieve the objective of creating a Malay Commercial and industrial community to overcome ethnic imbalances in employment structure. "Institutes of Technology of Mara, vocational institutions, and Polytechnics will continue to accelerate their programme to expand the supply of qualified Malays for participation in commerce and industry."

---

1. Ibid. p. 144.

"Under the Mid-Term Review, the allocation for education and training programmes of MARA increased from $85 million to $169.7 million. During 1974 and 1975, MARA was expected to construct three additional junior Science Colleges in Alor Star, Kuala Trengganu and Kuantan. MARA also intended to construct two more vocational institutions at Lumut and Kuantan."[1]

In West Malaysia, many regional and urban development plans were drawn up for different areas in the country with the broad aim of transforming the regional economies, overcoming backwardness and bringing these regions in line with other developed sites. Alternatively, regional plans aimed at bringing about development in new resource frontier zones. Since the suitability of a region for industrial location rests on the basis of its pull or attractiveness relative to other sites in the form of locational factors such as proximity to markets, supply of raw materials, transport system, other infra-structural facilities, skilled labour, and administrative centrality, regional development planning can be viewed as a measure aimed at industrial dispersion. This view is also supported by the fact that one of the strategies for regional development, especially in new resource-frontier areas is the development of small-scale resource-based industry tied in with agricultural development.

Some of these regional development plans are shown in Figure 4.2 The outstanding plans in the resource

---

1. Malaysia, Mid-Term Review of the Second Malaysia Plan, Op.cit., p. 16.

frontier areas are Pahang Tenggara, Jengka Triangle, Johore Penggerang and Trengganu Tengah. Others such as the Klang Valley Plan, Penang Master Plan and Kuantan Area Development are mainly urban studies. The Kemubu, Muda and Trans-Perak are basically agricultural schemes.

Whether all these fiscal and infra-structural incentives together with locational incentives would act as a sufficient pull to influence the locational decisions of manufacturing plants in favour of lesser developed sites is left to be seen in the future.

ii) Policy on Industrial Structure: the Promotion of Export-Oriented Industries and Labour-Intensive Industries

To accelerate the development of export-oriented manufacturing industries, the export incentives provided in the Investment Incentives Act, 1968 were reviewed and revised. The new scheme incorporated the provision of tax allowances based on the increase in export sales by specific amounts over a specific base period.[1]

As a new measure in export promotion, free trade zones[2] and export processing zones were set up in the 1970's for the promotion of exports of labour-intensive processing,

---

1. Malaysia, Mid-Term Review of the Second Malaysian Plan, P. 143.

2. They are termed free trade zones as the inputs and output are exempted from taxes as an incentive to encourage foreign investors. The entire output of these industries is exported.

assembly and component manufacturing industries. Free trade zones were set up in Bayan Lepas and Prai in Penang, Sungei Way in Selangor and Malacca Central in Malacca. Where establishment of a free trade zone was not feasible, customs facilities were provided in the form of licensed manufacturing warehouses as at Port Klang.

The measures designed for promoting exports of manufactured goods, apart from those listed above were outlined in the Mid-Term Review. They are listed as:

1) "high priority will be given to products in which Malaysia has a dynamic comparative advantage. Such products include those which are based on the use of local raw materials and which are labour intensive;
2) Special attention will be given to the needs of industry for upgrading quality, product design and sales promotion which take account of consumer preference in the importing countries;
3) Concerted attention will be given to the needs to carry out overseas market surveys and product research; and
4) in the light of complexities of international trading and the influence which multi-national corporations have on market outlets, investment by such companies in Malaysia particularly on a joint venture basis, will be encouraged consistent with international interests."[1]

In line with the need to provide priority for "products in which West Malaysia has a dynamic comparative advantage", a policy on local content of products was drawn

---

1. Mid-Term Review of the Second Malaysia Plan, Op.cit., p.147.

up to expand the utilization of local materials in industrial production.

To promote 'export substitutes' in place of import substitutes public corporations were established so that the policy on local content would be related to the decision on the exploitation of natural resources. The Federal Industrial and Marketing Authority (FIMA) was established in 1972. It began to participate in agro-based industry and has started the processing and canning of local fruits such as pineapples. A National Livestock Corporation was given the power to develop a livestock industry. Malayan Rubber Development Corporation (MRDC) formed joint venture projects with the private sector to manufacture rubber products.

The ban on the exports of log timber in 1971 compelled, indirectly, the setting up of timber processing industry, locally. Similarly an export duty on the export of rubber in its natural form had a deterrent effect on its exports in the hope of channeling it into industry producing rubber products for export. Petronas, a Government corporation, was established with the sole control over the Malaysian Petroleum industry.

The importance of various institutions such as The Malaysian Agricultural Research Institution (MARDI) and the Rubber Research Institution (RRI) which were established earlier on for research and quality control, was further enhanced during this period.

Fiscal incentives were introduced to encourage the use of local content in manufacturing. An additional

tax relief was allowed for firms which used more than 50 per cent of local materials in their production processes.

A Committee on Foreign Trade and Investment (COFTI) was established to study aspects of foreign markets. A separate International Trade Division was set up in the Ministry of Trade and Industry to deal with the exports of manufactured goods. A Malaysian Export Credit Insurance Scheme was planned to provide financial assistance to export-oriented industry.

Apart from encouraging export-oriented industry, the need to create employment was emphasised. With the aim of encouraging labour intensive industry, the payroll tax which was regarded as a disincentive to employing more labour was abolished in 1971.[1] For the first time a tax relief was awarded for employing more labour. This was incorporated as an Amendment to the Investment Incentives Act, 1968, under the term 'Labour Utilization Relief' in August 1973. A firm with a tax relief of two years based on the initial capital investment could obtain an extra one to three years of tax relief if it employed 100 to 300 additional employees during its initial tax holiday period. This scheme hoped to encourage small and labour-intensive industry.

iii) Policy on Foreign and Bumiputra Equity Participation

The Government had intentions of taking an active part in establishing manufacturing industry to increase

---

1. Malaysia, Second Malaysia Plan, 1971-1975, Government Press, Kuala Lumpur, 1971, p. 156.

local equity participation through a corporate structure. However, it still depended heavily on foreign limited companies and public companies especially in long term investments. This can be inferred from the statement that

"Such companies bring in capital as part of a package which includes production expertise, marketing connections and other advantages. Operating within a policy framework which ensures that Malaysia receives its share of economic and social benefits such foreign private investment can play an important developmental role. Foreign investments will be welcome in the future as in the past."[1]

To encourage the flow of more foreign capital, promotion centres were set up in selected countries. Centres at Dusseldorf, Tokyo, New York and San Francisco are a few examples. The Government hoped to enter into double taxation and investment guarantee agreements with more countries. She organised and participated in Investment Conferences in Zurich, the Scandinavian Countries and Japan to reveal investment possibilities in Malaysia.

While foreign capital is desirable and seems to be the basis of maintaining, if not achieving a higher rate of industrial growth, the problem of imbalances in the ownership of corporate and non-corporate assets in industry poses political problems. An aftermath of political nationalism in most newly independent countries is economic nationalism.[2] The tide of economic nationalism has in some

---

1. Malaysia, Second Malaysia Plan, op.cit., p.64.

2. Paauw, D.S., and Fei, J.C., Op.cit., p. 35-37.

way prompted import substitution in developing countries. In West Malaysia, economic nationalism, as expressed in the new economic policy, is expected to restructure society so that the racial economic imbalances could be corrected. Changes were planned in the free enterprise policy and in the ownership patterns of the industrial concerns in favour of nationals and those racial groups which had little or no participation in the past. By restructuring the Malaysian society along these lines, the Government hopes to achieve national unity.

Government has thus formulated policy on ownership particularly in connection with Bumiputra equity participation. It has set a target "that within a period of twenty years Malays and other indigenous people will manage and own at least 30 per cent of the total commercial and industrial activities in all categories and scales of operation."[1] All newly incorporated companies are required to reserve at least a thirty per cent share of its stock issue for Bumiputra participation.[2] Total foreign ownership of an industry is allowed only in wholly export-oriented industries which are located in the free trade zones. In industry which caters for the domestic market, foreign participation is restricted to a maximum of 30 per cent of the total equity participation.[3]

---

1. Malaysia, Second Malaysia Plan 1971-1975, P. 41-42.
2. Malaysia, Mid-Term Review of the Second Malaysia Plan. Op.cit., p. 15.
3. Federal Industrial Development Authority, Annual Report, 1973, P. 69-71.

To achieve greater participation by Malays and other indigenous people in the manufacturing activities a series of policy measures directed at the creation of an effective Malay entrepreneurial class were outlined. These included:-

i) "special measures to promote Malay entrepreneurship and ensure adequate supply of finance;

ii) accelerated development of the necessary skills and attitudes among Malays and other indigenous people;

iii) facilities and support for Malay and other indigenous traders and small businessmen to acquire or rent suitable and well-located premises;

iv) wider and a more active participation by the public sector;

v) the design of measures to enlist the assistance of non-Malay and foreign-owned commercial and industrial establishments in providing to Malays and other indigenous people in-service training, technical and advisory services, co-operation in marketing and purchasing activities, and in the financing of new enterprises;

vi) the application of policy instruments to foster balanced development in existing urban areas and new growth centres;

vii) a new approach with specially designed and vigorously implemented policies to bring commercial and industrial activities and life within reach of the rural Malays and other indigenous people; and

viii) comprehensive and intensive planning and research for the efficient design and implementation of commercial and industrial growth and policy."[1]

To achieve the above objectives it was stated that Government itself will initiate the setting up of enterprises and train the Malays and other indigenous people to then take over the enterprises in due course.

To facilitate entry of Bumiputras into the industrial sector, greater opportunity was to be given to them for technical, vocational and business training. The MARA vocational schools, the MARA Institute of Technology, the Ministry of Labour and Manpower and the National Productivity Centre were expected to train more Malays for industry. This would be supplemented by on-the-job training programmes sponsored and supervised by the Ministry of Labour and Manpower.

MARA, PERNAS and the SEDC's were expected to take up equity shares in joint ventures with the private sector. Such shares will eventually be transferred to individual ownership of the Bumiputras. In this connection, the household savings of Malays will be mobilised and invested through unit trusts. The Government established a Bumiputra Participation Unit and a Trust fund in the Ministry of Trade and Industry to facilitate acquisition of the reserved capital and to ensure that the shares bought or allocated will remain within this community.

---

1. Malaysia, Second Malaysia Plan, op.cit., p. 159.

The Urban Development Authority (UDA) was established with the aim of identifying and developing areas for use as commercial establishments for Bumiputras, especially in the major urban centres where this ethnic group, is not equitably represented in the commercial sector. The UDA also co-ordinated with MARA and the SEDC's in these matters.

Related closely to the question of Bumiputra equity participation and ownership is one of employment patterns reflecting the ethnic composition of the West Malaysian population. The policy aimed at achieving this goal stipulated that every industrial establishment should ensure that 40 per cent of its labour force in all categories of employment is Bumiputra.

It can be concluded that the industrial policy of the 1970's was based on the issues of social justice and economic growth. As such it has vested the power of selecting the appropriate industry and of carving a spatial industrial pattern in the hands of the Government who hopes to be assisted by the private sector, local and foreign, in achieving these objectives of economic nationalism.

The promotional measures outlined above, undoubtedly involve tremendous public expenditure. This is borne out by the amount allocated for development expenditure by the public sector under the Second Malaysia Plan. The public sector's share was $7250 million for Malaysia as a whole. Out of this targetted allocation, the actual public development expenditure would be at least $6,000 million (of this, public investment was estimated as

$4,307 million, after excluding expenditure on defence, purchase of land, loans and grants to the private sector and expenditure on the creation of physical assets owned by the private sector). The total sum allocated for the use of public funds to create assets owned and managed by the private sector was $742 million. With the private sector capital formation set at $7843 million ($6,175 million in West Malaysia), the aggregate planned investment from 1971 to 1975 was estimated as $12,150 million or 16.6 per cent of the Gross Domestic Product. However a target was set at $14,350 million for the total development expenditure.

The radical change in the approach to industrial promotion after 1969 and the measures introduced to implement it have been outlined. Apart from the Government's direct participation in industry, the main aim of these policies is to affect the individual manufacturer's choice of plant location. The first test, therefore, of the impact of Government policy is the individual managerial response to the change in industrial policy. Entrepreneurial decision-making is the theme of the next chapter.

CHAPTER V

ENTREPRENEURS' DECISION-MAKING SPACE AND PERCEPTIONS

5.1 Introduction

The decision-making of the individual manufacturers brings to mind the classical theory of plant location. Weberian theory analyses the location of the individual firm under conditions of perfect competition. It explores the relative attractions of labour, raw material and market locations when the locations of all other firms are given.[1] In addition to the Weberian model are the interdependence models. These basically analyse a few firms at a time, but are concerned with individual decision-making under conditions of perfect[2] certainty. All the major models of location theory, as Webber[3] points out, assume rational behaviour. Some function (profits) is maximised under stated conditions. In Weber's theory maximum profits are held to be identical to minimum costs. In the interdependence approach and in Losch's theory, maximum profits are effectively considered to be maximum sales. Once the profit functions have been defined the process of maximization is simple and subject to well-defined mathematical rules.

---

1. Smith, D.M., Industrial Location. An Economic Geographical Analysis. John Wiley and Sons, Inc. 1971 p. 112-119.
2. Ibid., p. 119-156.
3. Webber, M.J., Impact of Uncertainty on Location, The M.I.T. Press, 1972 P. 105.

In the real world situation as Webber has shown even if the concept of profit maximization is assumed the difficulty of defining the profit-function remains.[1] Information is not always available to the firms to permit them to analyse the manner in which their profits vary over space. Firms are unable to find the prices and the freight rates on raw materials to determine production costs and to evaluate the sales which can be made for every possible location. The location of all other firms or competitors and consumers is unknown. Thus, the uncertainties of the real world situation tend to highlight the fact that location theory is a static construction or a framework against which the actual pattern could be assessed.

Despite these limitations, it is useful as a framework for analysing the West Malaysian case, beginning with the premise that, at the micro level, the basic unit of study is the manufacturing firm and the objective is to predict the behaviour of the firm.[2] Hence what is crucial to the enquiry is not the assumption of the concept of maximization of profit but whether this assumption is valid in the West Malaysian context. In the last chapter it was pointed out that while the nature of industrial incentives offered by the Government appeared to be based on the assumption that entrepreneurs, especially foreign entrepreneurs, ventured into manufacturing with the motive of maximizing profits, analysts evaluating the pattern of

---

1. Webber, M.J., Op.cit., p. 105.

2. Wood, P.A., 'Industrial Location and Linkage', Area, Institute of British Geographers, 1969, No. 2. P.33.

reinvestments of profits came to the conclusion that this may not be the case. Hence, it is the objective of this chapter to discover what motivates investors, especially foreign investors to invest in the manufacturing sector of West Malaysia.

The enquiry into the primary and the secondary or derived[1] motives of the investors is undertaken as it could provide the answer to the relevance of industrial policy measures (especially economic inducements) as seen from the entrepreneurs' decision-making and problem - eliminating tasks. While the test of the effectiveness of the new industrial policy is the individual managerial response to the new incentives, these responses are determined by the primary and the derived motives of the investors. The extent to which the incentives are rated by entrepreneurs as overcoming obstacles to investment in the manufacturing sector influences their investment decisions.

The second objective of these investigations is to analyse the locational advantages of different industrial environments that have permitted industrial growth and still attract new manufacturing units. Manufacturing growth and dispersal is viewed from the entrepreneurs' decision-making position. This decision-making process is the subject of the analysis below. The investigations into the locational advantages of different sites are also undertaken with the aim of finding out whether various factors such as the

---

1. The term 'derived motives' is used in the sense that while the primary motive is that of profit maximization there are a number of secondary motives that are derived from the primary motive. Although the term 'derived motives' is not wholly satisfactory it is perhaps the best summary phrase of the diverse motivations underlying investment.

nature of industry, the capital or employment structure, the raw materials used (imported or local) and the export-oriented or domestic markets have a significant impact on the entrepreneurs' choice of industrial sites in West Malaysia.

5.2 Data Collection and Methodology

The method used in this enquiry is based on the analysis of data obtained from a sample survey of manufacturing establishments in industrial estates and free trade zones. The decision to confine the survey to industrial estates and free trade zones was based on the reasoning that these are sites allocated for manufacturing. It is unlikely that manufacturing units would be allowed to operate freely outside designated areas purely because economic and social constraints are generally such as to impose more stringent restrictions on where industrial development can take place owing to the nature of existing development or because planners have an obligation both to the prospective users and other land users of the regional economy as a whole.

But selection of a representative sample of industrial estates and free trade zones depend on the knowledge of manufacturing establishments in operation by 1975. Requests for a list of operating units by industrial estates with additional information on approximate employment size and industry type of each unit were made to the State Development Corporations. Since the State Development Corporations are themselves at different levels of operation, some having been created in the last few years and since

industrial estates and free trade zones are at different levels of development from the drawing board stage to levelling land and others having allocated land to prospective industrialists, requests and visits to State Development Corporations met with partial success. Comprehensive lists were obtained only for four States, Kedah, Penang, Selangor and Negri Sembilan.

From the basic data and with limitations imposed by time factor, a sample of six sites was drawn from the three States, Selangor, Penang and Kedah. This included the two most industrialised States and the agricultural and resource-based State of Kedah. The selected industrial estates and free trade zones and the sample size is given in Table 5.1.

The sample was not strictly stratified by employment or industry type. Selection was undertaken with the aim of including the broad industry types and employment categories. In two cases failure to contact the management led to a replacement by industrial establishments of the same industry type.

Having selected the cases, an interview method was preferred because it was found that mailed questionnaire gives a low rate of response. Interviews were preferred with the management since they were either directly involved in the decision taking on site selection or were aware of the actions of their predecessors.

Data collection on the two aspects of the study was planned differently. On the subject of factors of location, a pre-set questionnaire outlining thirty-three

TABLE 5.1. SAMPLE: INDUSTRIAL SURVEY, 1975

STATE	(1) INDUSTRIAL ESTATE/ (2) Free trade zone	No. of factories operating	No. Selected for interview
Selangor	Shah Alam (1)	126	10
	Sungei way (2)	11	5
Penang	Bayan Lepas (2)	24	6
	Prai (1)	25	5
	Mak Mandin (1)	19	5
Kedah	Tikam Batu) (1) Bakar Arang)	6	5
		211	36

Note: To maintain confidentiality of the firms surveyed, Tikam Batu and Bakar Arang industrial estates were combined as one site. This was possible, as both industrial estates are only a mile apart and they are located on the same side of the main north trunk road.

factors belonging to eleven groups was prepared based on location factor studies in developed countries,[1] and personal knowledge of Malaysian conditions. These are presented in Table 5.2.

The respondent for each case was first asked to assess the locational advantages of the region for his factory by means of ticking from the list all the factors that were important in the location of his particular plant. These were termed general location factors. Secondly, he was asked to rank the first five factors, typically the most important in the location of the plant in the locality at the initial period of location.

Thirdly, the respondent was asked to rank 5 significant factors influencing the location at the time of the survey.

Information on the second aspect of the study namely motives for investing was acquired indirectly without a pre-set questionnaire. The conversation approach was preferred because it was felt that a pre-set questionnaire could lead to answers that may be projected to be in the best interest of the industrialists rather than the actual

---

1. The following studies were used to draw up a list of locational factors.

   Mcmillan, T.E., Jr., 'Why Manufacturers choose Locations vs. Determinants of Plant Locations' Land Economics, August 1965. P. 239-246.

   'Regional Analysis and Economic Geography'. A Case Study of Manufacturing in the Bristol Region. G. Bell and Sons, Ltd., 1967, Chapter 6, P. 123-147.

   Keeble, D.E., 'Employment Mobility in Britain' in Spatial policy problems of the British Economy. Edited by Michael Chisholm and Gerald Manners, Cambridge University Press, 1971, P.24-66. 'Locational Migration from North-West London 1940-64.in Regional Analysis and Development Open university set book 1973, P.206-219. Hisao Nishioka and Gunter Krumme Location Conditions, Factors and Decisions: An Evaluation of Selected Location Surveys. Land Economics. Vol. XLIX No.2, May 1973, P. 195-205.

TABLE 5.2. LOCATIONAL FACTORS: INDUSTRIAL SURVEY

Materials:	Nearness to Raw Materials Availability of cheap raw materials Ready supply of abundant quantities of raw materials based on long term projections Power Water
Labour:	Availability of unskilled labour Availability of semi-skilled and skilled labour Low labour costs
Land sites:	Land for the construction of a spacious factory Relatively cheap land sites compared to other sites
Infra-structure:	Social facilities for workers Good public transport Benefits from the industrial estate Benefits from the Free-trade - zones Access to roads for loading/unloading Convenience of railways Access to pedestrian traffic Parking facilities
Port facilities	Nearness to airport Nearness to sea port
Markets	Central to major markets Area of high purchasing power
Inter-industry linkage:	Forward industrial linkage with other firms in Malaysia Backward industrial linkage
Administra-tive linkage	Nearness to the Ministry/Government offices for quick execution of plans and awareness of new rules and regulations. Co-operation of State Development Corporation
Personal:	Attractive environment Home of entrepreneur Ideal Location Prestigious location
Urban:	Within or near an urban centre of over 50,000 population size
Input costs: (comparative costs)	Lowest operational costs

motives. At the same time, through this approach, the major problems confronting the industrialists could be highlighted.

5.3 Motives for Investing in Manufacturing

It is clear from the sample survey that there is no straight forward explanation as to why local entrepreneurs invest in manufacturing or why companies invest abroad. The fundamental aim, however, is to maximise profits. "Maximization of profits" is perhaps not the most appropriate term. It could at best be defined as a "satisfactory level" of returns for investments and for risks taken, given the varying range of uncertainties, in which the manufacturers operate. "Satisfactory level" is placed in inverted commas because it is evident that business behaviour is so complex that a satisfactory level of returns cannot be measured in terms of a rigid mathematical formula. It remains an elusive objective of the firm, albeit a common one.

This fundamental goal is achieved through different derived motives and they are the means by which both the short and the long term goals are achieved. It is into these derived motives that this empirical study was able to gain insight. Kanapathy,[1] commenting on the motives for investment of multi-national firms suggested that, "profit maximization is only one of the complex of goals - growth

---

1. Kanapathy, V., Foreign Investment in Malaysia; Experience and Prospects. Occasional Paper 6, Institute of Business Studies, University Education Press, 1971, p.7.

and efficiency are also given equal importance." Kanapathy's view seems to be unrealistic as he is treating the means and the primary objective in the same perspective.

In the survey of thirty-six manufacturing establishments in the two free trade zones and four industrial estates within the States of Selangor, Penang and Kedah, the derived motives for investing in manufacturing in West Malaysia were significantly different for the ten establishments with 65 per cent or more Malaysian equity participation and the twenty six establishments with 40 to 100 per cent foreign ownership. The frequency of responses on the different motives are outlined in Table 5.3.

Foreign investors outlined five motives for investing in manufacturing. The managers of half the manufacturing units emphasised political stability. They also emphasised the knowledge that in the past private capital was very successful in the plantation and mining sectors. In addition, the policy regulations on double-taxation, terms on nationalization, and agreements on profit remittances were quoted as security measures. The second motive (measured by the frequency of responses) was the need to overcome tariffs and quotas imposed in export markets. This was cited as the main motive for investing in industry by 19 per cent of the foreign investors.

Third in importance were pioneer status and tax incentives - mentioned by 15 per cent of the foreign investors. Lower production costs were emphasised by 11 per cent of the investors and only one investor spoke of expansion policy to tap new markets from the South-East Asian base.

TABLE 5.3. DERIVED MOTIVES FOR INVESTING IN MANUFACTURING IN WEST MALAYSIA

	40-100% Foreign-owned Response Frequency	%	65-100% Malaysian-owned Response Frequency	%
1. To overcome quotas and tariffs imposed in export markets	5	19.2	-	-
2. Lower Production costs	3	11.5	2	20.0
3. Expansion policy to tap new markets	1	3.9	-	-
4. Pioneer status and other tax incentives	4	15.4	3	30.0
5. Political stability and history of free enterprise and general policy regulations on industrial investment	13	50.0	-	-
6. Dispersion of investments from mineral and plantation industry to manufacturing	-	-	2	20.0
7. To tap import-substitute market	-	-	3	30.0
Total	26	100.0	10	100.0

Malaysian investors mentioned four derived motives for investing in manufacturing. Tax incentives and the aim to tap import-substitute market were referred to by six establishments, while low production costs and the aim to diversify investment by branching into manufacturing from the mineral and plantation industry were emphasised by the remaining four units.

From the empirical study it is obvious, that the derived motives cannot be explained from the operation of the manufacturing unit in isolation. Motives have to be related to the firm's operation as a component of the chain of investment links of the multi-national and national investment bodies. Disincentives, tariffs, other trade barriers, incentives (such as investment agreements) relatively lower costs of production and the possibilities of minimising risks (judged from the political and investment climate abroad) can be viewed as analogous in this approach to transport costs within the classical theory of the firm's behaviour.

Thus investment abroad is seen as an alternative to selling abroad the produce of one's home plant; overseas investment becomes a special case in the general economics of location.[1]

---

1. Helleiner, G.K., 'Manufacturing Exports from Less-Developed Countries and Multi-national Firms' The Economic Journal, Vol. 83, March 1973, P. 22.

These findings can be compared with the survey of the motives of 533 United States Companies[1] operating abroad, quoted by V. Kanapathy. Strictly speaking, the surveys are not comparable because the American Survey incorporates corporations in all activities, manufacturing and others. Despite these limitations, some common trends are noteworthy. Twenty-one per cent of the American sample was reported to have mentioned Legal restrictions (tariffs and quotas) as the main motive for investing abroad. Despite the different sample sizes, this reason compares favourably with the West Malaysian industrial survey in which 19 per cent quoted the same motive for investing in West Malaysia. Lower production costs were the second motive in the American survey (20%) but it was low on the West Malaysian scale. This can be explained by the fact, that, as a result of the well developed commercial agricultural sector and tin mining industry wages in West Malaysia are comparatively higher than in the neighbouring developing countries and other Third World countries. This was remarked by industrialists interviewed in the survey. Both surveys also mentioned long range expansion policy although it was relatively lower in importance than other motives. Tax incentives were third in importance in the industrial survey but relatively less important in the American survey. American survey also reported inefficiency of native marketing institutions,

---

1. V. Kanapathy. Op.cit. P. 7. He quotes from the international Business Enterprise the following motives for investing abroad.
Legal restrictions (tariffs, quotas, etc.) 21%; Lower production costs 20%, inefficiency of native marketing institutions 14%, competition 12%; Dissatisfaction with international middlemen 11%; Long range expansion policy 7%; Invitation by foreign companies or governments 6%, Tax advantages 4%, other reasons 5%.

competition and dissatisfaction with international middlemen. These motives were not mentioned in the West Malaysian survey.

5.4 Motives for Investment: Economic Inducements to Private Investments

Although the West Malaysian policy on industrialization took a sharp turn from an unguided policy based entirely on free private enterprise in the late 1950's and early 1960's, to one of Government control and direct Government participation after 1969, yet private investments still remained the main instrument for achieving the targets in industrial growth and regional development.

As such, central to the Malaysian industrial policy was the issue of how to attract private investments especially foreign investments. Judging from the strategy adopted, it did seem that the expectation that capital inflows could be expanded rested on the ability to identify obstacles and take appropriate measures designed to control or eliminate these disincentives. The Pioneer Status Ordinance, the Investment Incentives Act of 1968 and the 1971 Amendments to the Act, indicated explicitly that in West Malaysia (as in most African countries[1]), economic inducements in the form of tax holidays, complete or partial exemption from income tax and customs tax, accelerated

---

1. S.R. Dixon-Fyle, 'Economic Inducements to Private Foreign Investment in Africa'. The Journal of Development Studies, Vol. 4, Oct. 1967, No.1. P.109-137.

depreciation concessions, tax stabilization guarantees, indirect inducements in the form of guarantees of security of investment, unrestricted repatriation of profits abroad, freedom of capital transfers and double taxation agreements completed the inducement package.

It cannot be denied that the design of the package reflected the underlying assumptions of what the obstacles and inducements to investment inflows were. It was explicit that the local taxation system was assumed to be a disincentive. The package also assumed as an immediate motive that investors intend to maximise their returns and as such economic and tax incentives were regarded as a step in the right direction.

The issue was further complicated by the fact that except for the locational incentives of 1973, the package had also been regarded as a multi-purpose mechanism to achieve the social and economic objectives of the development policy. For example, extension of the tax holiday from five to eight years together with the rest of the inducements was presented as a device for achieving equitable regional growth by attracting industry to development areas. It was also outlined as a device for achieving an industrial structure with the appropriate industry - mix to capitalise on the country's surplus resources of labour and land-based produce.

The pressure to achieve success in all quarters implied that the package of inducements was manipulated so as to conform to changing developmental objectives. In the process attention was diverted from the primary objective

of activating an inflow of private investment into the manufacturing sector. But what was most disadvantageous was that an atmosphere of uncertainty was created in the minds of prospective industrialists and those operating in the country. A great deal of speculation[1] on hypothetical situations took place following some modification.

Having outlined the strategy, what is important is how the different measures and incentives were rated by entrepreneurs as removal of obstacles or problems to investment in the manufacturing sector.

The motives for investment indicate that economic inducements especially tax concessions no longer acted as "catalysts" in activating responses from potential foreign investors. Similar reactions seem to be evident in other developing countries.[2] The main motives for investing abroad by multi-nationals outlined by G.K. Helleiner[3] can be summarised as a strategy for solving problems presenting challenges to the firms' profits, be they labour costs, distance costs or government influences in source countries or host countries.

The defensive nature of investments was also implicated in the derived motives for investment in the survey conducted. The problem solving objectives accounted

---

1. Reference here is made to the doubts and uncertainties expressed at the time of the industrial survey arising from the Industrial Co-ordination Act of 1975 and the Petroleum and Petroleum Products Act. Although opinions were expressed it was conclusive that the industrialists were not clear as to how the Acts would affect them. The disadvantages were presumed.

2. S.R. Dixon-Fyle, Op.cit., P. 112.

3. G.K. Helleiner, Op.cit., P. 35-40.

for 85% of the responses from foreign-owned firms in the survey, whether these were associated with the possibility of overcoming tariffs and quotas, or reducing production costs and hence making the products more competitive, or making investments secure by rating the political stability and investment climate as safe.

If inducement policy must necessarily be geared to investor's revealed preferences to fulfil the desired objectives of the host Government, then it can be concluded, though tentatively, that the West Malaysian promotional policy, evaluated against the entrepreneurs' derived motives for investing in the country, contains elements whose impact is more apparent than real.

While the favourable conditions for repatriation of profits and capital and nondiscriminate investment freedom coincided with the derived motives outlined, the large tax concessions appear to be a bonus.

The restructuring of multipurpose inducement policy into distinct discriminate incentives to tackle, a) the promotion of foreign investment, b) social and regional development issues, would have been more effective, judging from the derived motives of the investors.

The repeal of tax concessions as a general investment promotional device can be considered in the light that based on the industrial survey results, taxes were not regarded as a major disincentive. Applying Dixon Fyle's argument,[1] if a disincentive is marginal the corresponding incentives may be equally ineffectual. A

---

1. S.R. Dixon-Fyle, Op.cit., p. 121-122.

complete or partial exemption of company profits from taxation would be regarded by a potential investor as a positive inducement only if he was convinced that the prevailing effective level of income tax would produce unacceptable post-tax earnings. Similarly, a tax exemption which reduced production costs would be considered an incentive only if it increased potential net earnings to a level of minimum returns desired by the investor or provided the margin for survival. In both conditions, the efficiency of the investment incentives may be seriously questioned.

As there is no desire in the national interests to promote an industrial sector which can only survive in a protective environment or which consists of quick profiteers who refuse to consider social obligations, deletion of marginal incentives would act as an automatic check on the efficiency and productivity of the firm and ensure gains to both investors and the host Government. At the same time, the use of tax concessions solely as a discriminative locational incentive would have been a more effective social strategy measure.

The kind of industry which can be encouraged to achieve regional development will be examined from the locational advantages of different industrial environments that have permitted industrial growth, viewed from the entrepreneurs' decisions.

5.5 Factors of Industrial Location

From the list of thirty-three possible factors,

only twenty-seven factors were thought to be important, either in general or specifically. The six factors which did not get any response were:-

1) convenience of railways,
2) parking facilities,
3) access to pedestrian-traffic,
4) home of entrepreneur,
5) ideal location, and
6) prestigious location.

Lack of response for the factor, convenience of railways, emphasised the importance of road usage in commodity movement and movement of manufactured goods in West Malaysia. Parking facilities were not emphasised because in industrial estates and free trade zones parking facilities exist within the factory area. Access to pedestrian traffic was more important to non-factory size establishments outside the industrial estates which cater for made-to-order goods. Low priority for personal factors in modern industrial organizations which are based on shareholder capital explained the lack of response for the last three factors.

From the responses on general location factors it can be concluded that on average ten factors were considered significant in location decisions. The patterns of factor responses varied tremendously since even factors of marginal importance were ticked and given the same importance as factors which were considered crucial. As such very little importance can be attached to the general location factors and more importance is placed on the five

first ranking factors.

Frequency responses by rank order of the five factors in all sites are given in Table 5.4. No differences were indicated between locational advantages at the time of the construction of the plants and the present because the interval between the two time periods was short for most firms. In rank one were listed thirteen factors. Of these co-operation of the State Development Corporations (SEDC's) emerged as the most important factor followed by nearness to seaport, airport, centrality to markets and availability of land. In rank two, low labour costs was most important followed by centrality to markets and availability of power. In the third rank, the factors ranked as first appeared in a different order with more responses on the factor "seaport", followed by co-operation of the SEDC's. In the fourth rank, second rank factors re-emerged while in the fifth rank, factors such as ports and unskilled labour were again emphasised. The recurrent importance of a few factors was evident.

Throughout the interview, entrepreneurs had emphasised that while the choice of five factors as significant factors determining site selection was valid, the ordering or ranking of factors was impossible. They stressed that selection of site is not determined by any one factor but it is generally based on the combined effect of a number of complementary factors. Since the opinion poll was conducted to identify entrepreneurial decision-making, this comment was taken into consideration and aggregate responses on five significant factors are given in the subsequent tables and the analyses is so based.

TABLE 5.4 FREQUENCY RESPONSE BY RANK ORDER OF FIVE FACTORS: INDUSTRIAL SURVEY

	Frequency
Rank I	
Co-operation of State Development Corporations	5
Nearness to seaport	4
Central to major markets	4
Nearness to airports	4
Land for construction of spacious factory	4
Unskilled labour	3
Water supply	3
Lower labour costs	2
Availability of cheap raw materials	2
Benefits from the Industrial Estate	2
Benefits from the Free Trade Zone	1
Availability of semi-skilled and skilled labour	1
Nearness to raw materials	1
Rank II	
Low labour costs	5
Central to major markets	4
Power	4
Unskilled labour	3
Ready supply of abundant quantities of raw materials based on long term projections	3
Co-operation of State Development Corporation	2
Nearness to Ministry and Government offices	2
Nearness to seaport	2
Land for construction of a spacious factory	2
Rank III	
Nearness to seaport	11
Co-operation of State Development Corporation	5
Low labour costs	2
Available semi-skilled and skilled labour	2
Area of high purchasing power	2
Relatively cheap land sites	2
Land for the construction of a spacious factory	2
RANK IV	
Low labour costs	7
Power	4
Nearness to seaport	4
Social facilities for workers	3
Lowest operational costs	3
Nearness to raw materials	2
Nearness to air ports	2
Central to major markets	2
RANK V	
Nearness to seaport	4
Nearness to airport	4
Unskilled labour	4
Benefits from free trade zone	3
Co-operation of State Development Corporation	3
Nearness to Ministry and Government offices	2
Power	2

Table 5.5 gives the frequency response based on the five significant location factors for the entire survey sample. Nearness to seaport was the most important locational factor for the sample of industries in the sites surveyed. This was hardly surprising considering the fact that a large segment of manufacturing industry and the entire multi-national industry in the free trade zones is dependent on imported raw materials. The latter is also dependent on export markets. Furthermore, technology is largely borrowed from the developed and industrialized countries so that machinery and capital goods are mostly imported at least at the present stage of industrial development.

Low labour costs and power were next in importance, the former reflect the surplus labour capacity characteristic of developing countries. Co-operation of the SEDC's emerged as fourth in importance. Since the SEDC's are instrumental in planning sites, allocating sites and implementing industrial policy measures (particularly aspects such as equity participation and ethnic quotas in employment), the importance attached to these factors by industrialists, especially foreign industrialists, summarises the importance of administrative linkage and social involvement of industrial decisions, not to mention the political overtones.

Centrality to markets and the more strictly economic factors of land requirements, availability of unskilled labour and airports, in this order of importance, also stood out as significant factors but they had a lower frequency of responses than those discussed above.

Table 5.5. FREQUENCY RESPONSE BASED ON THE FIVE MOST SIGNIFICANT LOCATION FACTORS: INDUSTRIAL SURVEY

	Individual Factors	Survey Factor Groups	
Nearness to seaport	22	Ports	29
Low labour cost	16	Labour	31
Power	16	Materials	32
Cooperation of State Development Corporations	14	Administrative	17
Central to major markets	12	Markets	14
Land for construction of spacious factory	11	Land	18
Availability of unskilled labour	9		
Nearness to airports	9		
Benefits from Free Trade Zone	7	Infra-structure	19
Availability of semi-skilled & skilled labour	6		
Benefits from Industrial Estate	5		
Relatively cheap land sites	5		
Backward industrial linkage with manufacturing firms in Malaysia	5	Inter-Industry Linkage	10
Ready supply of abundant quantities of raw materials based on long term projections	5		
Near or within urban centres of over 50000 pop.size	4	Urban	4
Social facilities for workers	4		
Lowest operational costs	4	Input costs	4
Water supply	4		
Availability of cheap raw materials	4		
Nearness to raw materials	3		
Foward industrial linkage with other manufacturing industry in Malaysia	3		
Nearness to Ministry or Government offices for quick execution of plans and awareness of new rules and regulations	3		
Land for expansion	2		
Area of high purchasing power	2		
Attractive environment	2	Personal	2
Good public transport	2		
Access to roads for loading/unloading	1		
All Factors	180		180

Linkage with other industry as a source of raw materials or as an outlet for manufactured goods in the vertical integration of industry was a less emphasised factor. This suggests the weak linkage between the dualistic aspect of the West Malaysian economy. It also reflects the linkage of specialised labour-intensive activities and components production to the vertically integrated international industry rather than a linkage to local industry. It also suggests the limitations of the contribution of the multi-national industry.[1]

Taken as factor groups, materials (particularly power and labour), ports, infra-structure, land, administrative linkage and markets, albeit in a descending order, emerged as the decisive factors in plant location according to the entrepreneurs' choice.

To determine if there were significant differences in the locational advantages of different sites, the frequency responses were analysed according to the six selected sites. The results are shown in Table 5.6.

It is evident from the table that unlike other studies in developed countries,[2] locational advantages outlined in the different industrial estates and free trade zones are generally common, with only a few deviations.

---

1. G. Helleiner, G.K., Op.cit., P. 46.

2. Britton, J.N.H., Regional Analysis and Economic Geography. A case study of Manufacturing in the Bristol Region. G. Bell and Sons. Ltd., 1967 P. 123-147. Alexandersson, G., Geography of Manufacturing. Prentice Hall, Englewood Cliffs, New Jersey, 1967.

Table 5.6. FREQUENCY RESPONSE BASED ON FIVE SIGNIFICANT LOCATION FACTORS BY INDUSTRIAL ESTATES AND FREE TRADE ZONES

	I	II	III	IV	V	IV
Nearness to seaport	5	4	-	6	3	4
Low labour cost	4	3	4	-	4	1
Power	3	3	1	4	3	2
Cooperation of State Development Corporation	1	1	4	-	5	3
Central to major markets	2	4	1	4	1	-
Land for construction of spacious factory	-	2	3	4	1	1
Availability of unskilled labour	1	-	1	1	2	4
Nearness to airport	1	-	-	2	2	4
Benefits from Free Trade Zone	-	-	-	-	4	3
Availability of semi-skilled & skilled labour	-	-	1	5	-	-
Benefits from industrial estate	1	1	-	3	-	-
Relatively cheap land sites	2	1	1	-	1	1
Backward industrial linkage with manufacturing industry in Malaysia	-	1	-	3	-	1
Ready supply of abundant quantities of raw materials based on long term projections	2	1	1	1	-	-
Near or within urban centres of 50000 pop. size	1	-	-	3	-	-
Social facilities for workers	1	-	-	2	1	-
Lowest operational costs	-	-	2	2	-	-
Water supply	-	1	1	2	-	-
Availability of cheap raw materials	-	-	3	1	-	-
Nearness to raw materials	-	-	-	-	-	-
Forward industrial linkage with other manufacturing industry in Malaysia	-	1	-	1	1	-
Nearness to Ministry or Government offices	-	-	-	1	-	2
Land for expansion	-	-	-	2	-	-
Area of high purchasing power	-	-	-	-	-	-
Attractive environment	1	-	-	1	-	-
Good public transport	-	-	-	1	1	-
Access to roads for loading/unloading	-	1	-	-	-	-
All Factors	25	25	25	50	30	25

Key

I	Prai Industrial Estate	IV	Shah Alam
II	Mak Mandin Industrial Estate	V	Bayan Lepas Free Trade Zone
III	Tikam Batu and Bakar Arang	VI	Sungei Way Free Trade Zone

This could be attributed, perhaps, to the availability of required facilities in the sites surveyed. It could also be explained by the distance factor - a distance of only 300 miles separates the northern industrial estates of Tikam Batu/Bakar Arang from the Southern estate of Shah Alam. The close proximity of sites to urban centres of Kuala Lumpur, George Town and Butterworth and the ports of Klang and Butterworth/Penang and a well developed transport system linking these sites with the ports and the towns may be contributory factors.

The relative differential advantages among these sites were also noteworthy. Availability of semi-skilled and skilled labour in Shah Alam was rated second in importance to Port Klang. In Tikam Batu/Bakar Arang, port facilities were low on the scale but proximity to raw materials especially timber and rubber was emphasised. In Kedah and in Bayan Lepas, namely, sites which were in the urban-rural fringe areas, administrative linkage assumed priority over other factors. In the free trade zones, benefits from free trade zone in the form of customs and tax exemption on raw materials was rated high on the scale of importance. Apart from these locational advantages, relatively low labour costs, a surplus of unskilled labour were considered important locational factors in all sites except Shah Alam. Centrality to markets was rated highly in Mak Mandin and Shah Alam by manufacturing units producing for a domestic market.

Analyses of locational factors by broad industry groups, employment size of firms, fixed capital, ownership

of capital, local and foreign component of raw materials and/or markets are tabulated in Tables 5.7 to 5.10.

It is conclusive from these cross-tabulations that the differences in employment size, industry type, capital-amounts and ownership - and origin of raw materials and destination of products did not lead to a replacement of one set of factors by another set of factors; only a slight change in the order of importance of the six common factors occurred. These factors were:- ports, lower labour costs or availability of unskilled labour power, land, administrative linkage and centrality to markets.

The relationship between the fundamental and the derived motives of the investors and the Government's industrial policy have been evaluated. The likely response of management to changes in industrial policy measures have been analysed from the entrepreneurs' viewpoint of the relevance of industrial policy measures to his decision-making. The locational advantages of different industrial sites have also been evaluated on the basis of entrepreneurs' opinions. If the conclusions of this sample study are representative of management they would be reflected in the aggregate pattern of industrial development in the 1970's in West Malaysia, since the aggregate pattern is at least in part the product of the decision-making of management of the individual manufacturing units. In the next chapter an attempt is made to analayse the aggregate industrial performance over time and in space.

Table 5.7. FREQUENCY RESPONSE BASED ON FIVE SIGNIFICANT LOCATION FACTORS BY BROAD INDUSTRIAL CATEGORIES

	Industry Group		
	Consumer Non-Durable	Intermediate	Capital Goods
Nearness to seaport	3	6	13
Power	3	7	6
Land for construction of a spacious factory	3	4	4
Lower labour costs	2	8	6
Central to major markets	2	6	4
Backward industrial linkage with manufacturing industry in Malaysia	2	1	2
Cooperation of State Development Corporation	2	4	8
Social facilities for workers	1	3	-
Availability of semi-skilled and skilled labour	1	3	2
Nearness to raw materials	1	2	-
Relatively cheap land sites	1	4	-
Ready supply of abundant quantities of raw materials based on long term projections	1	3	1
Water supply	1	3	-
Near or within towns of 50,000 pop. size	1	2	1
Access to roads for loading/unloading	1	-	-
Land for expansion	-	1	1
Availability of cheap raw materials	-	3	1
Nearness to airport	-	5	4
Unskilled labour	-	2	7
Area of high purchasing power	-	1	1
Lowest operational costs	-	3	1
Forward industrial linkage with other manufacturing industry in Malaysia	-	2	1
Attractive environment	-	2	-
Good public transport	-	1	1
Benefits from Industrial Estate	-	2	3
Benefits from Free Trade Zone	-	-	7
Nearness to Ministry and Government Offices	-	2	-
All factors	25	80	75

Table 5.8. FREQUENCY RESPONSE BASED ON FIVE SIGNIFICANT LOCATION FACTORS BY EMPLOYMENT SIZE OF PLANTS

	Employment Size	
	Below 200	200 to 1,000
Nearness to seaports	10	12
Low labour cost	9	7
Power	9	7
Central to major markets	7	5
Land for construction of spacious factory	5	6
Availability of unskilled labour	5	4
Nearness to airport	5	4
Availability of semi-skilled and skilled labour	5	1
Cooperation of State Development Corporations	4	10
Ready supply of abundant quantities of raw materials based on long term projections	4	1
Lowest operational costs	4	-
Availability of cheap raw materials	4	-
Benefits from the Industrial Estate	3	2
Relatively cheap land sites	3	2
Backward industrial linkage with manufacturing industry in Malaysia	3	2
Benefits from the Free Trade Zone	2	5
Near or within urban centre of over 50,000 pop. size	2	2
Social facilities for workers	2	2
Nearness to raw materials	2	1
Forward industrial linkage with other manufacturing industry in Malaysia	2	1
Nearness to Ministry and Government offices	2	1
Water supply	1	3
Attractive environment	1	1
Good public transport	1	1
Land for expansion	-	2
Area of high purchasing power	-	2
Access to roads for loading/unloading	-	1
All factors	95	85

Note A Chi-Squared test with 26 degrees of freedom gave a value of 32.8 which is not significant at the 95 per cent level of confidence.

Table 5.9. FREQUENCY RESPONSE BASED ON FIVE SIGNIFICANT LOCATION FACTORS BY CAPITAL AND OWNERSHIP OF CAPITAL

	Amount of Capital Invested		Ownership of Capital		
	Less than $1 million	Over $1 million	65% or more Malaysian	Joint ventures 60-40 Malaysian-Foreign or vice versa	90% or more Foreign
Nearness to seaport	6	16	2	12	8
Low labour cost	4	12	7	2	7
Power	4	12	6	6	4
Cooperation of State Development Corporations	4	10	2	3	9
Central to major markets	3	9	5	6	1
Land for Construction of Spacious factory	3	8	3	5	3
Availability of unskilled labour	5	4	1	4	4
Nearness to airport	3	6	3	2	4
Benefits from Free Trade Zone	2	5	-	2	5
Availability of semi-skilled & skilled labour	2	4	2	2	2
Benefits from Industrial Estate	1	4	2	2	1
Relatively cheap land sites	-	5	3	-	2
Backward industrial linkage with manufacturing industry in Malaysia	-	5	-	3	2
Ready supply of abundant quantities of raw materials based on long term projections	1	4	4	1	-
Near or within urban centres of 50,000 population size	1	3	-	2	2
Social facilities for workers	1	3	-	3	1
Lowest operational costs	3	1	1	2	1
Water supply	-	4	1	2	1
Availability of cheap raw materials	3	1	2	1	1
Nearness to raw materials	2	1	2	1	-
Forward industrial linkage with other manufacturing industry in Malaysia	1	2	1	2	-
Nearness to Ministry or Government offices	3	-	-	2	1
Land for expansion	-	2	-	2	-
Area of high purchasing power	-	2	1	-	1
Attractive environment	1	1	1	1	-
Good public transport	1	1	1	1	-
Access to roads for loading/unloading	-	1	-	1	-
All factors	55	125	50	70	60

Table 5.10. FREQUENCY RESPONSE BASED ON FIVE SIGNIFICANT LOCATION FACTORS BY LOCAL OR FOREIGN[1] COMPONENT OF RAW MATERIALS AND LOCAL OR FOREIGN MARKET OF EACH PLANT

	Imported Raw Materials & Foreign Markets	Imported Raw Materials but Domestic Markets	Local Raw Materials & Domestic Markets
Nearness to seaports	11	9	2
Cooperation of State Development Corporations	11	2	1
Low labour costs	8	5	3
Unskilled labour	7	2	-
Benefits from Free Trade Zone	7	-	-
Nearness to airport	7	1	1
Power	6	6	4
Central to major markets	3	6	3
Relatively cheap land sites	2	2	1
Land for construction of spacious factory	2	5	4
Social facilities for workers	2	2	-
Nearness to Ministry and Government offices	2	1	-
Backward industrial linkage with manufacturing industry in Malaysia	2	1	2
Lowest operational cost	2	1	1
Availability of semi-skilled and skilled labour	2	1	3
Availability of cheap raw materials	2	-	2
Near or within towns of 50,000 pop. size	2	1	1
Good public transport	1	-	1
Attractive environment	1	-	1
Benefits from Industrial Estate	1	3	1
Forward industrial linkage with manufacturing industry in Malaysia	1	2	-
Area of high purchasing power	1	-	1
Access to roads for loading/unloading	1	-	-
Water supply	1	1	-
Ready supply of abundant quantities of raw materials based on long term projections	-	2	3
Land for expansion	-	1	1
Nearness to raw materials	-	1	2
All factors	85	55	40

1. Local or Foreign component of Raw Material or markets is based on a minimum of 70% of the total inputs and production respectively.

CHAPTER VI

THE POST 1969 INDUSTRIAL PATTERN

In the last chapter attention was focussed on the behaviour of the firm in understanding some of the processes of industrial location and industrial investment. The summation of the individual firm's behaviour at the micro-level together with direct Government participation can be expressed as the aggregate locational behaviour at the macro-level in West Malaysia. The aggregate industrial performance is the subject of the analysis below.

6.1 The Growth Performance of the Manufacturing Sector

The shift in the Malaysian industrial policy from one dependent entirely on free market enterprise in the late 1950's and most part of the 1960's to another with direct Government participation in industry, in the 1970's was outlined in chapter four. As the new industrial strategy has recently been introduced, the performance of the sector within five years of its implementation cannot be strictly examined with the aim of evaluating the success of the new strategy, but the direction which industry takes could perhaps provide a glimpse into the trend that events would take.

In 1968 the industrial sector[1] as a whole accounted for 24.7 per cent of the GDP at factor cost in current prices. The share of the manufacturing sector to GDP was 12.3 per cent.

---

1. This includes mining and quarrying, manufacturing and construction activities.

Over the 1969 to 1973 period the contribution of the industrial sector remained steady, around the 25 per cent mark. But in 1974, its contribution increased to 28.4 per cent (Table 6.1). Within this group the manufacturing sector recorded an upward trend with a contribution reaching 19 per cent in 1974 (Table 6.1).

The average annual growth of the manufacturing sector compared with that of the other sectors and the GDP is perhaps a better indicator of its increasing significance in the West Malaysian economy. Table 6.2 shows the average annual increase in value added of the manufacturing sector compared with the growth of the other components of the economy for the periods 1968 to 1970, 1971 to 1974 and 1957 to 1970. The data indicate that between 1968 and 1970 the manufacturing sector grew at a rate 3.7 times that of the GDP. It was the single largest sector reflecting such a high growth rate, far surpassing the rates of growth of the agriculture and service sectors. In the 1970 to 1974 period, the average annual increase in value added of manufacturing amounted to 21.3 per cent. Despite the favourable prices of agricultural export commodities particularly rubber, agriculture still remained second to manufacturing in its contribution to an increase in value added. The favourable prices and increase in demand for natural rubber were brought about by high petroleum prices resulting in high cost of production of synthetic rubber.

As the 1971 to 1974 period coincided with the major part of the Second Malaysia Plan period, a comparison of the manufacturing growth rate during this period with that of the First Malaysia Plan period (1965 to 1970) is

210

Table 6.1 CONTRIBUTION OF THE MAJOR SECTORS TO GROSS DOMESTIC PRODUCT AT FACTOR COST IN CURRENT PRICES, 1968 - 1974 (Actual value in $ million)

Sector	1968	1969	1970	1971	1972	1973	1974
Agriculture, Forestry Hunting and Fishing	2481 32.2%	2704 33.5%	2428 29.1%	2450 28.05%	2359 24.96%	3658 30.59%	4758 30.27%
Mining and Quarrying	645 8.4%	623 7.7%	548 6.6%	2187* 25.04%	2448* 25.90%	3028* 25.32%	4000* 28.44%
Manufacturing	946 12.3%	1007 12.5%	1254 15.0%	1366 15.64%	1571 16.62%	2026 16.94%	2674 19.01%
Construction	308 4.0%	318 3.9%	290 3.5%				
Power, Water, Sanitary Services	194 2.5%	205 2.5%	221 2.6%				
				4098** 46.91%	4643** 49.13%	5271** 44.08%	5806** 41.28%
All other Services	3123 40.6%	3224 39.9%	3832 43.2%				
Gross Domestic Product	7697	8081	8352	8735	9450	11957	14006

* Combined value of the industrial sector consisting of mining and quarrying, manufacturing and construction

** combined value for power, water, sanitary services and all other services.

Source: Derived from Table A 3.3

Table 6.2 AVERAGE ANNUAL INCREASE IN VALUE ADDED: MANUFACTURING AND OTHER SECTORS

SECTORS	1968-1970	1965-1970	1957-1970	1971-1974
Agriculture, Forestry, Hunting and Fishing	3.9	4.8	3.7	20.6
Mining and Quarrying	-7.7	-1.5	6.9	
Manufacturing	15.5	12.5	10.4	21.3
Construction	-2.8	1.3	9.5	12.9*
Power, Water and Sanitation	6.8	11.4	10.7	10.8**
All other Services	7.6	3.0	5.3	
Gross Domestic Product	4.2	4.1	5.4	14.2

* combined value of mining, manufacturing and construction.

** includes power, water, sanitation and all other services.

made. A figure just short of doubling the rate of increase was evident. It can be deduced from these comparisons that in the early 1970's the manufacturing sector had emerged as the dominant sector in the West Malaysian economy.

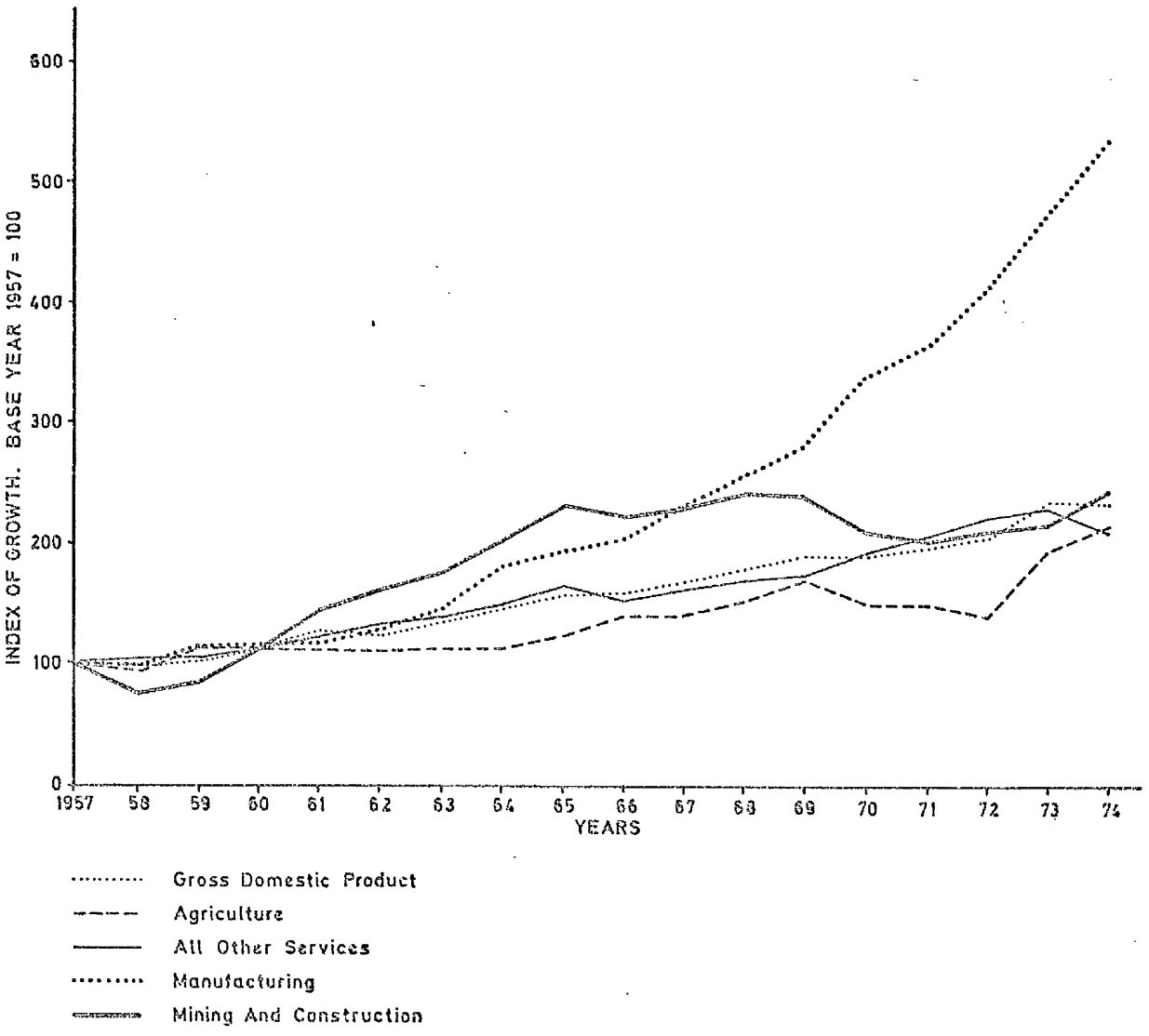
The indices of growth of the different sectors and the GDP from 1957 to 1974 at current prices and at factor cost (with 1957 as the base year with an index of 100) have been calculated to show comparative growth trends among the sectors and the GDP (Appendix Table A3.3). The manufacturing sector had an index of 349 in 1970. By 1974 an index of 745 was reached. The Agricultural sector recorded an index of 156 in 1970 and with rapid increases between 1972 and 1974, it reached an index of 304 in 1974. The GDP had comparable indices of 196 and 331 for these years.

As these comparisons in growth trends are based on current prices, the impact of price increase is included. A more precise comparison is the growth in real value of the sectors and the GDP. It is derived by calculating the indices of growth at constant price (the 1967[1] price index). The growth trends of the various sectors and the GDP at constant price are shown graphically in Figure 6.1. The Manufacturing sector had achieved an index more than double that of any other sector and the GDP, by 1974 although

---

1. As the rates of price increase up to 1967 were below one per cent per annum no adjustments are made and sector values and GDP in current prices and real value are taken to be the same. After 1967 adjustments are made based on the consumer price index. (See Appendix Table A 3.3b)

Fig:6.1 GROWTH TRENDS IN REAL VALUE OF EACH SECTOR AND THE GROSS DOMESTIC PRODUCT AT FACTOR COST, 1957 TO 1974 (ACCORDING TO 1967 PRICES)



APPENDIX TABLE: A3.3

in 1967 it was merely five points ahead of the mining and construction sector. Its growth in the early 1970's was most spectacular.

Data on its contribution to employment, compared with that of other sectors, are available only for 1970. Table 6.3 shows the contribution to employment by major sectors of the economy. From the data, it is clear that manufacturing sector's contribution to employment of 10.5 per cent was only third in importance. Its contribution was relatively less important than the contribution of the agricultural and service sectors. Together, these two sectors employed 70 per cent of the workforce. These data also show that the manufacturing sector's contribution to GDP was not examplified in its contribution to employment. In 1967 its contribution to employment was 3.4 per cent below its contribution to GDP. By 1970 the differences had widened to 4.5 per cent.

The widening of the gulf between its contributions to employment and to value added is reflected in the differential level of contributions to the increase in GDP and to the increase in employment by manufacturing compared with other sectors (Table 6.4). While a third of the increase in GDP between 1967 and 1970 was brought about by the manufacturing sector, it created only a fifth of the jobs during the same period. On the contrary, agriculture, transport and communications, and service sectors had employed more workers though the productivity of these sectors was lower than that of manufacturing. This merely suggests that labour-intensive industry had not been forth-

Table 6.3 EMPLOYMENT BY MAJOR SECTORS 1970

	1970 Actual Figs (000)
Agriculture, Forestry Hunting & Fishing	1369
	49.1%
Mining and Quarrying	85.0
	3.1%
Manufacturing	292.0
	10.5%
Construction	78.0
	2.8%
Power, Water and Sanitation	21.0
	0.8%
Transport and Communication	115.0
	4.1%
All other Services	823.0
	29.6%

Source - Mid-Term Review of the Second Malaysia Plan, Table 4.4, p.77

Working age group is defined as 15 to 64.

Table 6.4 SECTORAL CONTRIBUTION TO THE INCREASE IN GROSS DOMESTIC PRODUCT AND INCREASE IN EMPLOYMENT BETWEEN 1967 AND 1970

Sector	Increase in G.D.P. 1967-70 Actual value (million)	in %	Increase in Employment 1967-1970 Actual Value (thousand)	in %
Agriculture, Forestry, Hunting, Fishing	159	14.36	91.50	27.54
Mining and Quarrying	-79	-7.13	17.60	5.18
Manufacturing	393	35.50	83.40	24.57
Construction	1	0.09	-5.90	-1.74
Power, Water and Sanitation	36	3.25	3.50	0.97
Transport and Communication	48	4.34	20.50	6.04
All other services	549	24.64	127.10	37.44
Total change	1107	100.00	246.20	100.00

Note. For calculations only the terminal values are used.

coming or that capital was given a preference over labour in industrial production techniques.

The Mid-Term Review of the Second Malaysia Plan states that between 1971 and 1973 employment in manufacturing was created at an average annual rate of 9.5 per cent giving rise to 100,000 jobs by 1973. This figure surpassed the target which was set at an average annual increase of 7 per cent for the five-year period (1971 to 1975), when the plan was drafted (Table 6.5). The Review also states that an average annual increase in value added of 16.1[1] per cent was achieved. If this was so, then the differences between the two contributions reflect an even wider gap of 6.6 per cent with employment in manufacturing lagging far behind its contribution to value added. This trend certainly creates doubts about the ability of the manufacturing sector to tackle the unemployment problem as effectively as desired. In terms of its contribution to production it had achieved a level of success higher than the target set for the 1971 to 1975 period.

The need to increase export-oriented industry was another aspect of the industrial strategy. Achievement of the target (15 per cent per annum) implied that about 35 per cent of the increase in the value of exports over the 1971 to 1975 period would have to be manufactured goods.

---

1. This figure quoted by the Mid-Term Review of the Second Malaysia Plan is in some ways modest. Calculations based on the Treasury figures give an average annual increase in the manufacturing sector's value added of 17.6 per cent. If this figure is used, then the difference of 8.1 per cent between manufacturing sector's contribution to output and to employment is obtained.

Table 6.5 A COMPARISON OF THE ACHIEVEMENTS OF THE MANUFACTURING SECTOR IN 1973 WITH THE TARGETS OUTLINED FOR THE PLAN PERIOD 1971-1975.

Aspects of Manufacturing	Targets for 1975	Mid-term Review of Achievements by the end of 1973
Value Added in Production		
Total ($ million)	2014	2116
Average annual growth rate	12.5%	16.1%
Employment		
Number of new jobs (000)	108	100
Average Annual growth rate	7.0%	9.5%
Exports		
Gross value of exports of manufactures ($ millions)	1036	1550
Average annual increase	15.0%	18.8%

Source: Second Malaysia Plan p.153, and Mid-Term Review of the Second Malaysia Plan,p.142,Table 8.1

In 1970 only 10 per cent of the exports were manufactured goods[1] (these included exports of imported items such as tin and petroleum products). The target was achieved by 1973. Net exports amounted to 20 per cent of all manufactured output by 1973. Net exports increased by 18.8 per cent per annum, higher than the planned target of 15 per cent. Export-oriented electronic components and equipment, clothing and wood products industries were the main elements contributing to the growth in exports.[2]

6.2 Regionalization on the basis of Manufacturing Indicators

Allied closely with the performance of the manufacturing sector vis-á-vis the other sectors of the economy is the spatial distribution of elements that constitute the manufacturing sector. Unfortunately data for the post-1969 period are scarce. The only available statistics are those from the Surveys of Manufacturing Industry 1969, 1970 and 1971.[3] But certain indicators which measure the district-level breakdown of manufacturing along certain dimensions are given in the surveys quoted above and using these data a fairly detailed analysis is possible.

---

1. Malaysia, Second Malaysia Plan, Op.cit., p. 153.
2. Mid-Term Review of the Second Malaysia Plan. Op.cit., P. 142 and 143.
3. West Malaysia, Department of Statistics. Survey of Manufacturing Industry West Malaysia. 1969, 1970, 1971.

It is obvious, that the data from the 1971 Survey of manufacturing industry would provide the latest and most up-to-date information, yet for purposes of comparison with the analyses in the subsequent chapters, the 1970 Survey data is used. The year 1970 has been chosen because a large number of surveys and censuses on socio-economic aspects in West Malaysia were carried out in this year and subsequent chapters draw heavily from these data sources.

An attempt to work out a spatial pattern of manufacturing industry at the district-level is more difficult than it would seem at first glance. Variations in the level of manufacturing exist in a number of forms, spatially. They could be measured based on a whole range of variables. These include: the number of establishments, the district's contributions to gross sales, value added in manufacturing, full-time employment, salaries and wages earned in the manufacturing sector and contribution to fixed capital invested in the manufacturing sector.

In chapter three it was proved that the use of any one criterion in the analysis of spatial patterns of manufacturing was inadequate. As such, the use of a single criterion to define spatially manufacturing regions, is ruled out. Using the 1970[1] district-level data, five indicators denoting different dimensions of the level of manufacturing, are extracted. These include: the number

---

1. West Malaysia, Department of Statistics, Survey of Manufacturing Industries, 1970.

of establishments, the Gross sales, the value added, Full-time paid employment and salaries and wages.

The spatial patterns denoting the level of manufacturing are directly related to and are affected by spatial variations in industrial productivity and industrial structure. Hence the pattern is incomplete without reference to the causal factors. Variations in industrial productivity, however, take diverse forms reflecting the cumulative and individual impact of the major factors of production. Industrial productivity, thus, can be expressed in terms of the productivity of labour which is measured quantitatively as the value added per worker; or it can be expressed as the productivity of capital which can be measured as the value added per thousand dollars worth of capital utilised. Cumulative productivity of all factor inputs can be measured as the total value added per establishment expressed in monetary terms.

Industrial structure can be spatially depicted as the profile of industrial activities (number of industrial activities at the four digit-level M.I.C. by districts). The capital intensive or labour-intensive structure is inferred from indicators such as employment per establishment and the value of fixed assets per establishment. The ratio of the value of fixed assets to labour employed and vice versa provide the comparative quantitative measures of the bias towards capital - or labour - intensive forms of production. These indicators are calculated at the

district-level.

This period, as noted earlier, marks the second phase of industrial development. A comparison with some indicators of the initial period (1968), despite the very short time interval, may be indicative of changes that are taking place. For this purpose, indicators which measure changes in structure and productivity are selected. These changes are measured as an index using 1968 as the base year with an index of one. Indicators chosen include the following: An index measuring changes in the amount of fixed assets per establishment, an index measuring changes in the ratio of the value of fixed assets to employment, and an index measuring changes in the ratio of employment to fixed assets.

Lastly, areal differences in the mean salary per worker are calculated as a significant indicator of the regional economic affluence, employment opportunities and the calibre of the labour force in manufacturing.

Thus, in all eighteen different indicators are chosen to denote the spatial variations in manufacturing along four main aspects - level of manufacturing, structure, productivity and industrial change between 1968 and 1970. Any attempt to map these individually as eighteen maps would prevent their comparison with one another to arrive at some significant conclusions, quite apart from the difficulty and the limitations of visual comparisons.

As a preliminary step, a principal component analysis is applied, to group together indicators with

similar patterns into components so that a few orthogonal components may be selected for "the convenience of working in few dimension".[1] These components are "orthogonal yet conceptually related."[2]

The choice of component analysis is guided by the following oonsiderations. In multivariate classification, the primary indicators are interrelated, as such, they contain redundant information which measures the same thing to some degree in the form of a series of overlaps. In reality, they would possess varying potentials in differentiating between the indicators if correlations are removed. Factor-analytic methods serve to isolate a new set of factors that summarise the information contained in the original indicators while removing the compounding elements derived from multi-colinearity among the original variables.[3] The choice of component analysis from the various factor-analytic methods available is guided by the fact that unlike factor analysis, it is a method of reducing data to orthogonal form. This is equivalent to rewriting the data matrix in a form in which each column (containing measurements on one variable) is unrelated to any other column.[4] The number of components is equal to the number of variables. One can select a few components, sacrificing a small

---

1. Mather, P.M., 'Varimax and Generality', Area, Institute of British Geographers, 1971, Vol. 3, No. 4, p. 155.

2. Norris, J.M., 'Functional Relationship in the interpretation of Principal Component Analysis', Area, Institute of British Geographers, 1971, Vol. 3, No. 4, P. 217.

3. Rummel, R.J., Applied Factor Analysis, Northwest University Press, 1970, P. 130.

4. Mather, P.M., Op.cit., P. 254, 255.

percentage of the information in the data for the convenience of working in a few dimensions. As the main purpose of this exercise is to rewrite the data in orthogonal form before it can be analysed and since a few components would contain the relevant information, this method seems to be most appropriate. The first step in component analysis is to derive the produce moment correlation matrix which provides the correlation coefficients among the primary variables. This is given in Table 6.6. The correlation coefficients indicate the associations among the variables. Very high correlations were evident among the primary indicators denoting the locational variation in the level of manufacturing. These were value added in manufacturing, full-time paid employment, fixed assets, the range of industrial activity. Gross wages and salaries were also highly correlated to the above mentioned indicators. Similarly gross sales were correlated (although at a lower level of significance) to three of the above indicators.

Among the indicators chosen to represent industrial productivity, value added per worker was correlated with the total value added and with fixed assets per establishment and fixed assets per full-time employee but the loadings were lower in comparison to those discussed above. Many of the correlations were causal and locational. For example, total fixed assets were highly correlated with gross salaries and wages reflecting skilled workforce as a prerequisite to the utilization of equipment tied up in fixed assets. It was also correlated with total full-time paid employment reflecting either the ability of capital-intensive

Table 6.6 CORRELATION COEFFICIENT MATRIX OF MANUFACTURING INDICATORS

Indicators	I	2	3	4	5	6	7	8	9	I0	II	I2	I3	I4	I5	I6	I7	I8
I Total value added	I.00																	
2 Total fixed assets	0.97	I.00																
3 Gross value of sales	0.47	0.53	I.00															
4 Gross salaries and wages	0.99	0.95	0.48	I.00														
5 Total full-time paid employment	0.97	0.92	0.52	0.99	I.00													
6 Fixed assets per establishment	0.I6	0.30	0.54	0.08	0.05	I.00												
7 Fixed assets per full-time employee	0.I4	0.27	0.5I	0.06	0.02	0.98	I.00											
8 Ratio of fixed assets to value added	0.05	0.I6	0.2I	0.04	0.03	0.35	0.34	I.00										
9 Value added per establishment	0.30	0.35	0.37	0.27	0.27	0.30	0.23	0.08	I.00									
I0 Value added per full-time employee	0.37	0.08	0.I4	0.00	-0.02	0.33	0.3I	-0.09	0.08	I.00								
II Value added / Fixed assets	-0.05	-0.I2	-0.I6	-0.04	-0.03	-0.I6	-0.I4	-0.63	0.06	0.07	I.00							
I2 Index of changein value added/ estb.	0.I3	0.II	-0.I2	0.I2	0.09	-0.06	-0.06	0.0I	0.06	0.I3	0.27	I.00						
I3 Index of change in fixed assets/estb. I968--70.	-0.05	-0.06	-0.06	-0.63	-0.07	0.04	0.0I	0.05	0.02	0.06	0.05	0.5I	I.00					
I4 Index of change inratio of F.T.empl./ fixed assets	-0.02	-0.04	-0.05	-0.09	-0.02	-0.06	-0.04	-0.37	0.I7	0.22	0.46	-0.04	-0.22	I.00				
I5 Index of change in the ratio of fixed assets / F.T.employment	-0.04	-0.05	-0.04	-0.0I	-006	0.05	0.04	0.04	-0.00	0.05	0.09	0.I7	0.9I	-0.22	I.00			
I6 Ratio of full-time empl./ fixed assets	-0.20	-0.23	-0.28	-0.I9	-0.20	-0.25	-0.23	-0.43	-0.33	0.34	0.50	0.08	-0.I4	0.39	-0.I5	I.00		
I7 Salary per worker	0.I7	0.26	0.4I	0.I0	0.07	0.79	0.77	0.II	0.42	0.28	0.03	0.02	0.25	0.02	0.27	-0.I9	I.00	
I8 No. of industrial activities	0.62	0.58	0.57	0.66	0.72	0.03	-0.28	0.I3	0.33	-0.II	-0.II	-0.I2	-0.09	-0.04	-0.07	-0.29	0.07	I.00

Note Significant correlations at the 95 per cent probability level for a sample of 70 ($\geq \pm 0.35$) are underlined.

manufacturing units to create employment or the locational co-existence of capital-intensive and labour-intensive units. Investment in capital was associated with the range of industrial activities, value added per establishment and total sales. The association reflected the greater efficiency and higher productivity of capital-intensive units.

Full-time paid employment was associated with the range of industrial activities while gross sales were significantly correlated with capital-intensive industry (denoted by fixed assets per establishment and fixed assets per employee). Capital intensity also reflected under-utilized capital in a positive significant correlation with the ratio of fixed assets to value added and a negative correlation with the ratio of value added to fixed assets.

The index denoting change in the ratio of employment to capital (fixed assets) over the 1968 to 1970 period was correlated with productivity (ratio of value added to fixed assets) reflecting an increase in productivity brought about by a favourable ratio of labour to capital. On the other hand an index denoting a change in value added per establishment was correlated with an index denoting a change in the ratio of fixed assets per establishment. This association reflected the use of more capital to bring about an increase in the firm's productivity.

Based on these associations among the primary variables, as many components as there are variables, are produced by the component analysis procedure. Of these, four components with eigenvalues[1] greater than two are

---

1. Eigenvalue is defined as the sum of the squared component loadings.

extracted. These four components accounted for 72 per cent of the variance in the data. These components are listed in Table 6.7. Only the first four components were selected for subsequent analysis. The selection was determined by the fact that these four components have eigenvalues greater than two. Furthermore, they cumulatively accounted for three-quarters of the variability of the original data set; the details lost in omitting the subsequent components were insignificant. In addition, when the components were plotted against the percentage of variance extracted by each component, after component four, there was a sharp fall in the variance extracted by the subsequent components (Figure 6.2).

The matrix of unrotated component loadings is given in Table 6.8 but the four components chosen for analysis are rotated using the varimax rotational method to produce more informative terminal components.[1] The matrix of rotated component loadings is given in Table 6.8.

---

1. As the principal component analysis is based on linear combinations of variables, so the first component may be viewed as the single best summary of linear combinations in the data and so on. Each subsequent component is, thus, the best linear summary of the residual variance in the data, after the preceeding components are taken care of. As a result, the first few components usually explain most of the variance in the data (as indicated by the four components extracted above). Some component structures are more parsimonious and simpler than others, some are more informative than others. Using varimax rotational method (it is the only method which maintains the orthogonal form of the components) for rotating the first four significant components, a simpler and more meaningful pattern is achieved without upsetting the mathematical properties of the solution. See Norman H. Hie, C. Hadlai Hull, Jean C. Jenkins, Karin Steinbrenver, Dale H. Bent, Statistical Package for Social Sciences (SPSS Manual), Mcgraw Hill Book Series, 1975, P. 470.

Fig:6.2 GRAPH SHOWING PERCENTAGE OF VARIANCE EXTRACTED BY DIFFERENT COMPONENTS IN THE PRINCIPAL-COMPONENT ANALYSIS

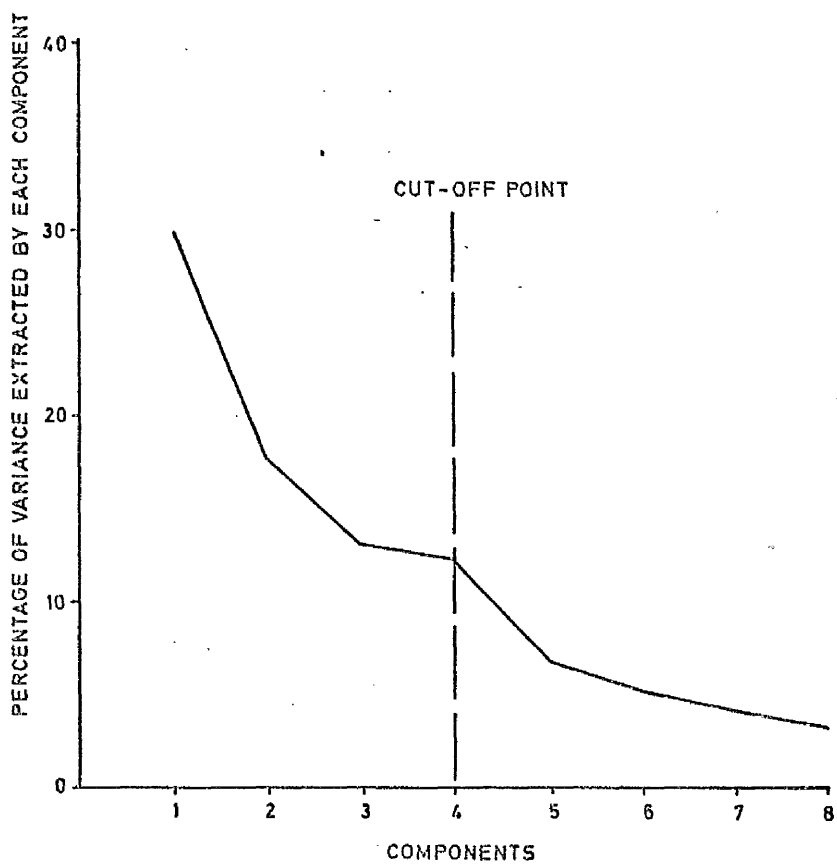


Table 6.7 EIGENVALUES AND PERCENTAGE OF VARIANCE EXTRACTED BY THE COMPONENTS

Component	Eigenvalue	% of variance extracted	Cumulative% of variance extracted
I	5.37	29.8	29.8
II	3.14	17.5	47.3
III	2.34	13.0	60.3
IV	2.17	12.1	72.4
V	1.19	6.6	79.0
VI	0.91	5.0	84.1
VII	0.71	4.0	88.0

Table 6.8 COMPONENT LOADINGS

Primary Indicators	Unrotated				Varimax Rotated			
	I	II	III	IV	I	II	III	IV
I. Total Value Added	0.88	-0.38	0.04	0.I5	0.97	0.09	-0.0I	0.03
2. Total fixed assets	0.92	-0.24	0.05	0.09	0.93	0.22	-0.09	-0.00
3. Gross value of Sales	0.74	0.I7	0.II	-0.I7	0.53	0.55	-0.II	-0.I2
4. Gross value of salaries and wages	0.86	-0.45	-0.0I	0.I5	0.99	0.0I	-0.0I	0.0I
5. Full-time paid employment	0.85	-0.48	-0.02	0.I3	0.99	-0.0I	-0.0I	-0.0I
6. Fixed assets per establishment	0.50	0.75	0.28	-0.20	0.06	0.94	-0.I9	0.02
7. Fixed assets per full-time employee	0.46	0.76	0.29	-0.22	0.02	0.93	-0.I8	-0.05
8. Ratio of fixed assets to value added	0.29	0.42	-0.55	-0.23	0.04	0.24	-0.78	-0.03
9. Value added per establishment	0.49	0.I4	0.20	0.02	0.32	0.44	0.2I	0.07
I0. Value added per full-time employee	0.09	0.26	0.57	0.08	0.0I	0.43	0.23	0.02
II. Value added per ($000) of fixed assets	-0.22	-0.27	0.68	0.30	-0.05	-0.04	0.87	0.I3
I2. Index change in value added per establishment I968-70	0.43	0.02	0.00	0.62	0.I5	-0.I0	0.04	0.56
I3. Index of change in fixed assets per establishment I968-70	-0.0I	0.37	-0.I7	0.89	-0.07	0.06	-0.06	0.98
I4. Index of change in the ratio of fixed assets / full-time employee	-0.00	0.37	-0.I5	0.79	-0.08	0.I0	0.0I	0.89
I5. Index of change in the ratio of full-time empl. per ($000)of fixed assets.	-0.II	-0.24	0.7I	-0.09	-0.00	0.I0	0.72	-0.25
I6. Ratio of full-time employment to fixed assets	-0.43	-0.32	0.58	0.07	-0.I8	-0.23	0.54	-0.I5
I7. Salary per worker	0.46	0.68	0.35	0.08	0.07	0.88	0.06	0.24
I8. Number of industrial Activities	0.70	-0.34	-0.I4	0.04	0.74	0.02	-0.04	-0.09

Note: Significant loadings at the 95 per cent probability level ($\geq \pm 0.35$) are underlined.

The loadings of the individual indicators assist in the identification of the new components. Seventeen of the eighteen primary variables loaded highly on one component indicating that the "component complexity of the variables is one".[1] The only exception was the variable 'gross sales'. It loaded highly on two components reflecting its dual functional relationship.

Component I accounts for 30 per cent of the total variance in the data set. Five indicators loaded very highly on this component. This component measures spatial variations in the overall level of manufacturing. The spatial variations in the contribution to manufacturing were indicated by six variables that load on this component. These were: value added in manufacturing, fixed assets, gross sales, gross salaries, full-time paid employment and the range of manufacturing activities.

Component II defines spatial variations in capital intensity and productivity (to a lesser extent) in manufacturing. Capital-intensive production and productivity were associated locationally with skills and economic affluence. In this component the capital intensive structure was denoted by high loadings of variables such as fixed assets per establishment and fixed assets per full-time paid employee. Affluence and skills were indicated by the variable, 'salary per worker'. Productivity was denoted by the moderate loading of indicators such as gross sales, value added per establishment and value added per full-time

---

1. Ibid., p. 475.

employee. Component II explains 18 per cent of the variance in the data set.

Component III shows that the productivity of capital and the productivity of labour in 1970 was brought about by the change in the ratio of labour to capital between 1968 and 1970. As a result of this change, the productivity of these factor inputs was associated with the ratio of employment to capital in 1970 and negatively associated with the ratio of fixed assets to value added. Component III accounts for 13 per cent of the variability in the data.

Component IV extracts 12 per cent of the variance. It explains a change in the productivity of the average manufacturing unit between 1968 and 1970. This change was related to a change in the capital-labour ratio within the same period and a change in the capital input per establishment within the same period. Three variables loaded highly on this component to indicate this relationship. They were the index measuring a change in value added per establishment between 1968 and 1970 and the possible causal variables - an index measuring change in the ratio of fixed assets to full-time paid employment and the index measuring a change in the fixed assets per establishment.

The scores on all the four components for each of the seventy districts are provided as part of the statistical output of principal component analysis. They are scores describing the relative position of each case (district) on each of the four components. The scores, thus, can be used in analysing or comparing cases on the different

components. Component scores have one feature that is not shared by many other variables. They embody a phenomenon with a functional unity. The phenomena are highly interrelated in time and in space.[1]

Based on the component scores of Component I, the districts in West Malaysia can be categorised into eight groups which denote their level of manufacturing in a descending order of importance from group one to group eight. The districts in the different groups are shown in Table 6.9. Kuala Lumpur belonged to the first group all by itself. The next three groups were also dominated by nine-districts in the west coast of West Malaysia. It was only in group five that the districts of the east coast (Tanah Merah and Kota Bahru) appeared into the pattern. Eighteen districts belonged to the seventh group and half the total number of districts (35) in West Malaysia belonged to the last group.

Figure 6.3 shows the spatial variation in the level of manufacturing derived from the component scores of Component I. A pattern of spatially isolated patches of industrial concentration was highlighted. The Klang Valley (Klang and Kuala Lumpur districts) has developed as a "corridor" of industrialization.It is the only well-defined region on this component. Individual districts - Johore Bahru in the south, Butterworth and Bukit Mertajam in the north, Kinta in the north-central - have emerged as

---

1. Rummel, R.J. Op.cit., P. 150-152.

Fig: 6.3 SPATIAL VARIATION IN THE LEVEL OF MANUFACTURING 1970 BASED ON THE SCORES COMPONENT I

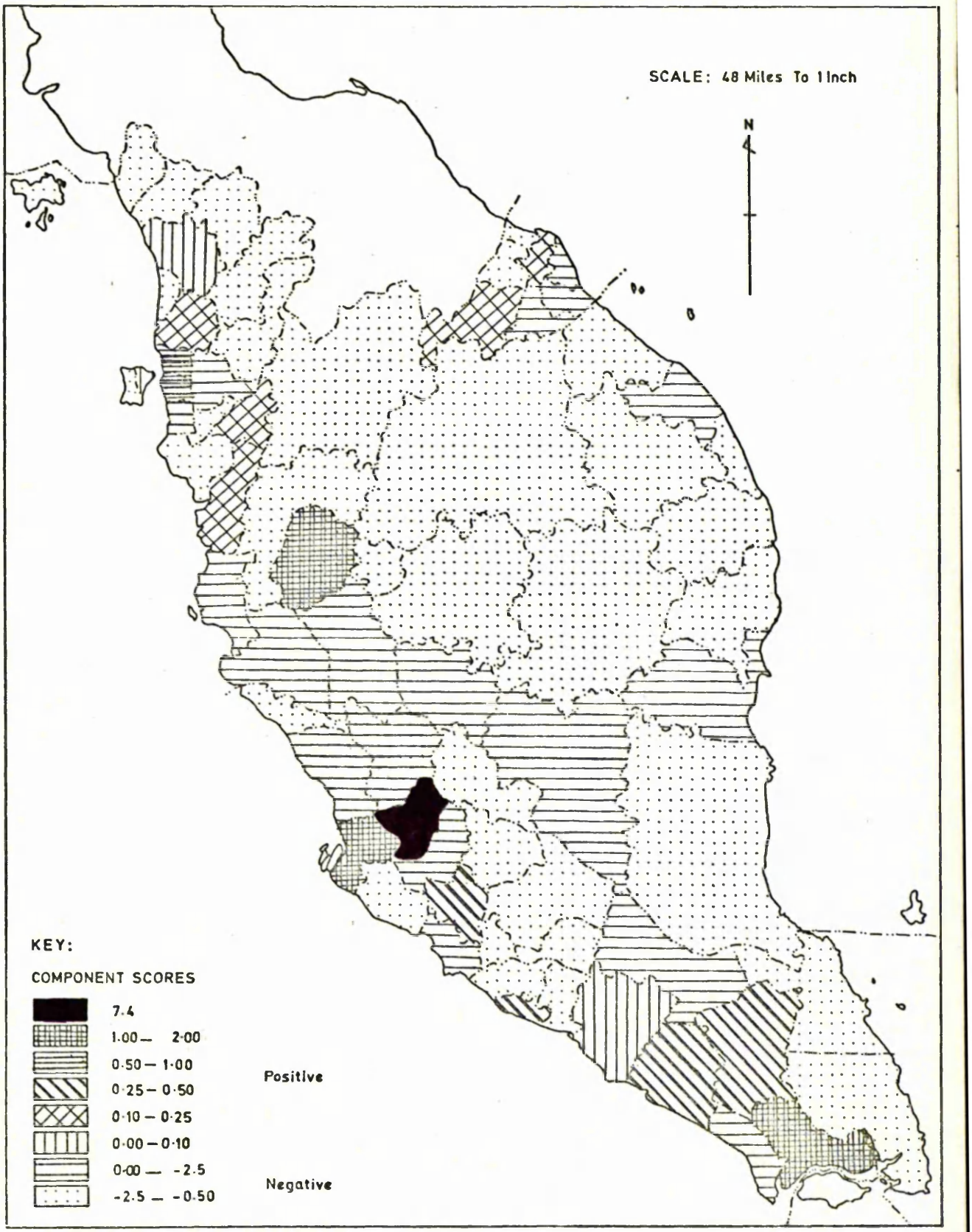


Table 6.9 EIGHT GROUPS OF DISTRICTS ACCORDING TO THE LEVEL OF MANUFACTURING IN 1970

Group I -	Kuala Lumpur		
Group II -	Johore Bahru, Klang, Kinta.		
Group III -	Bukit Mertajam and Butterworth.		
Group IV -	Seremban, Kluang, Batu Pahat, Malacca Central.		
Group V -	Larut/Matang, Tanah Merah, Kuala Muda, Kota Bahru.		
Group VI -	Penang North-east, Muar, Kota Star.		
Group VII -	Kuantan	Kuala Trengganu	
	Pontian	Machang	
	Dindings	Pasir Puteh	
	Kuala Selangor	Kulim	
	Lower Perak	Port Dickson	
	Nibong Tebal	Termeloh	
	Segamat	Bachok	
	Ulu Langat	Raub	
	Ulu Selangor	Batang Padang	
Group VIII-	Kuala Langat	Besut	Jasin
	Kuala Pilah	Pasir Mas	Penang south-west
	Kubang Pasu	Kemaman	Yen
	Krian	Baling	Upper Perak
	Perlis	Lipis	Mersing
	Pekan	Ulu Trengganu	Bandar Bahru
	Tampin	Alor Gajah	Sik
	Bentong	Marang	Padang Terap
	Kota Tinggi	Tumpat	Sabak Bernam
	Dungun	Ulu Kelantan	Langkawi
	Kuala Kangsar	Cameron Highlands	Jerantut
	Rembau	Jelebu.	

industrialised areas. These areas were surrounded either in the adjacent districts or just short distances away by districts with a lower level of industrial performance. Observed carefully, the spatial patterns of industrialised core regions with peripheral areas appear to provide the beginnings of three regional industrial belts that may assume a pattern similar to the industrialised Klang Valley region. The industrial belt in the Klang Valley was also showing signs of expansion southwards into Seremban district and Ulu Langat district. A west coast locational bias by industry was overwhelmingly evident. In the east coast, Kota Bahru, Tanah Merah and Kuantan reflected a potential which need to be developed. In the remaining districts of the east coast, very little impact has been made by industry.

The scores on Component II denoted spatial variations in capital intensity and productivity of the manufacturing sector (Figure 6.4). Highest score was found in Port Dickson district where the capital-intensive petroleum refining industry was located. High scores were also recorded by the districts of Bukit Mertajam, Alor Gajah, Dindings, Kuala Kangsar, Johore Bahru, Termeloh and Klang. The siting of industrial estates in these districts had led to the concentration of capital-intensive medium and large industrial enterprises controlled by foreign investment or in joint venture with local capital. As the production was based on imported technology the productivity was higher than that of small scale, less capital intensive units.

Figure 6.5 shows the distribution of districts that indicated changes in industrial productivity brought

Fig: 6.4 SPATIAL VARIATION IN CAPITAL INTENSITY AND PRODUCTIVITY OF THE MANUFACTURING SECTOR, 1970. BASED ON SCORES OF COMPONENT II

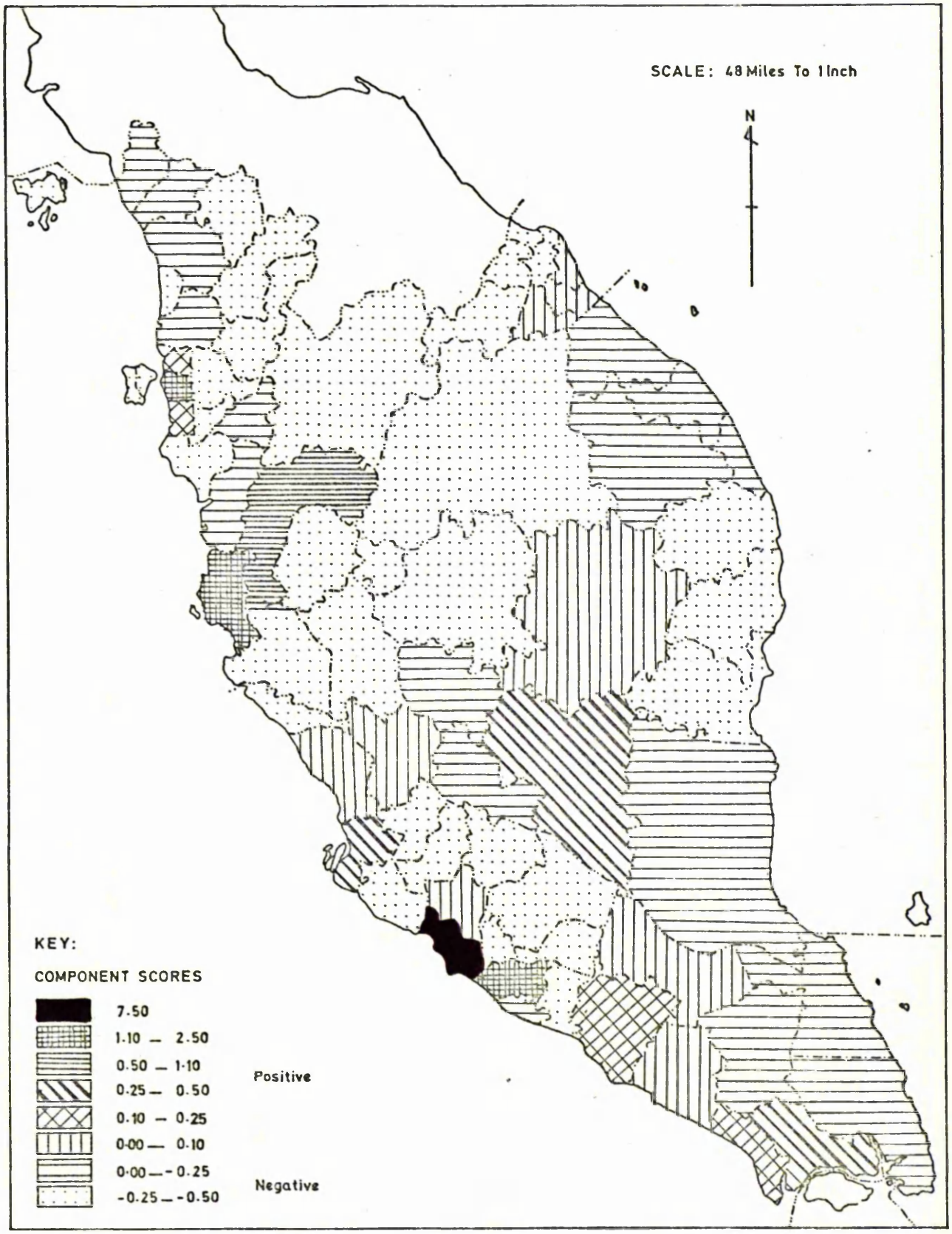
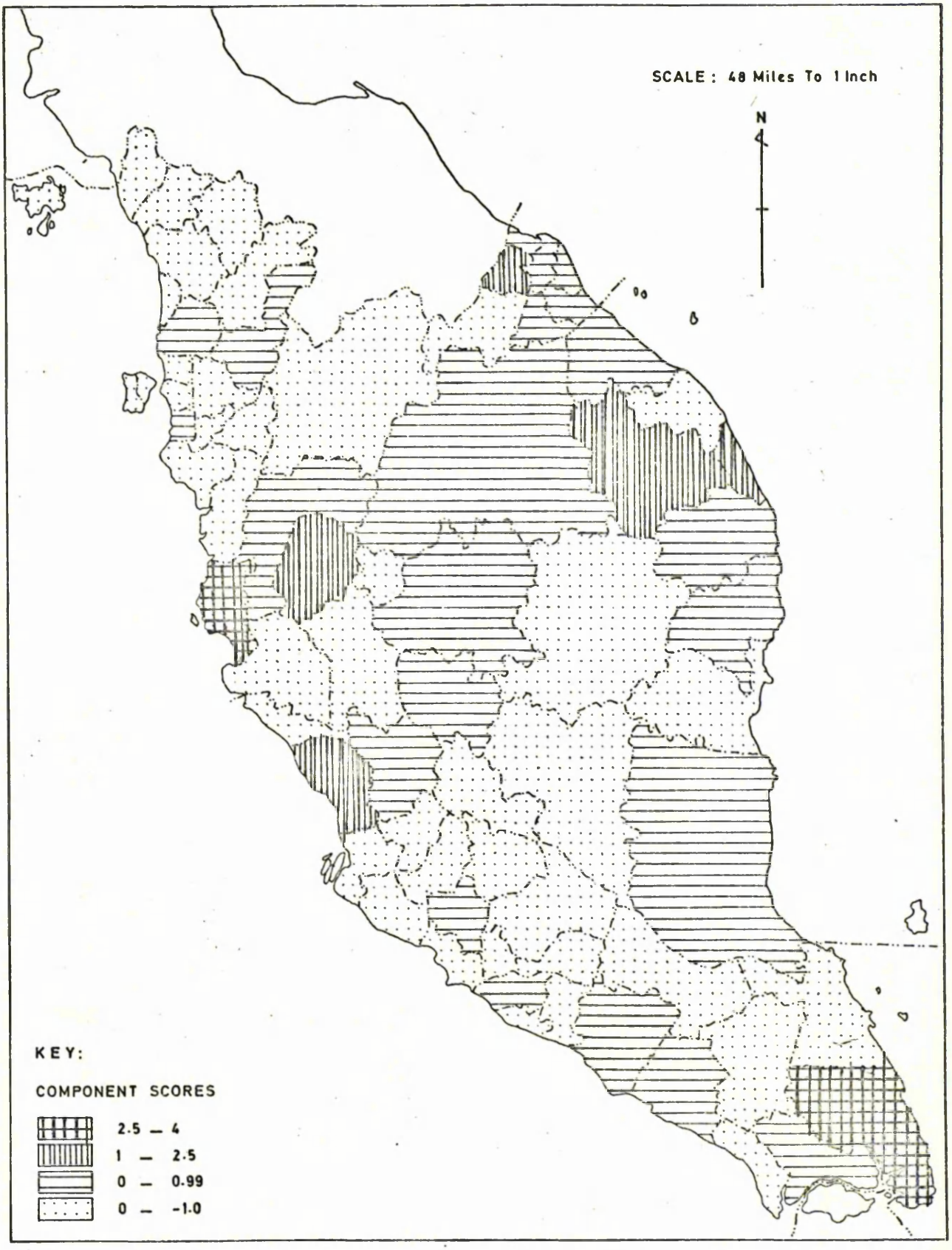


Fig:6.5 CHANGES IN INDUSTRIAL PRODUCTIVITY BROUGHT ABOUT BY AN INCREASE IN THE RATIO OF LABOUR TO CAPITAL BETWEEN 1968-1970. BASED ON SCORES OF COMPONENT III



about by an increase in the ratio of labour to capital between 1968 and 1970 (Component III). Twenty-nine districts record positive scores on this component. In general, the low values of the scores indicate that the change was not very marked. The Dindings and Kota Tinggi were the only districts with scores of 3 to 4 while another five districts (Kinta, Marang, Ulu Trengganu, Kuala Selangor and Pasir Mas) had scores of 1 to 2.5. The remaining twenty-two districts with positive scores had scores below one. Furthermore, these districts (except Kinta) were low on the level of manufacturing. As such, interpretation has to be made cautiously. Since these districts demonstrated a low level of industrialization changes based on a low baseline tend to produce indices (scores) which are high relative to their impact. Despite these limitations, the change reflected a positive change, since the increase in productivity was associated with resource-based districts mentioned above.

Spatial impact of the change in industrial structure (Component IV) is shown in Figure 6.6. Twenty districts recorded a positive score on this component. The scores are fairly high for Alor Gajah, Tanah Merah, Kuala Trengganu, Termeloh and Kuala Selangor districts. These districts contain resource-based industry. This trend seems to be in line with the policy of upgrading and improving the industrial position of these districts.

Figure 6.7 charts the scores of districts on Component II against their ranks based on the scores of Component I. A comparison shows that there was no regular

Fig:6.6 CHANGES IN INDUSTRIAL PRODUCTIVITY RESULTING FROM AN INCREASE ON CAPITAL IMPUT, BETWEEN 1968-70 BASED ON SCORES OF COMPONENT IV

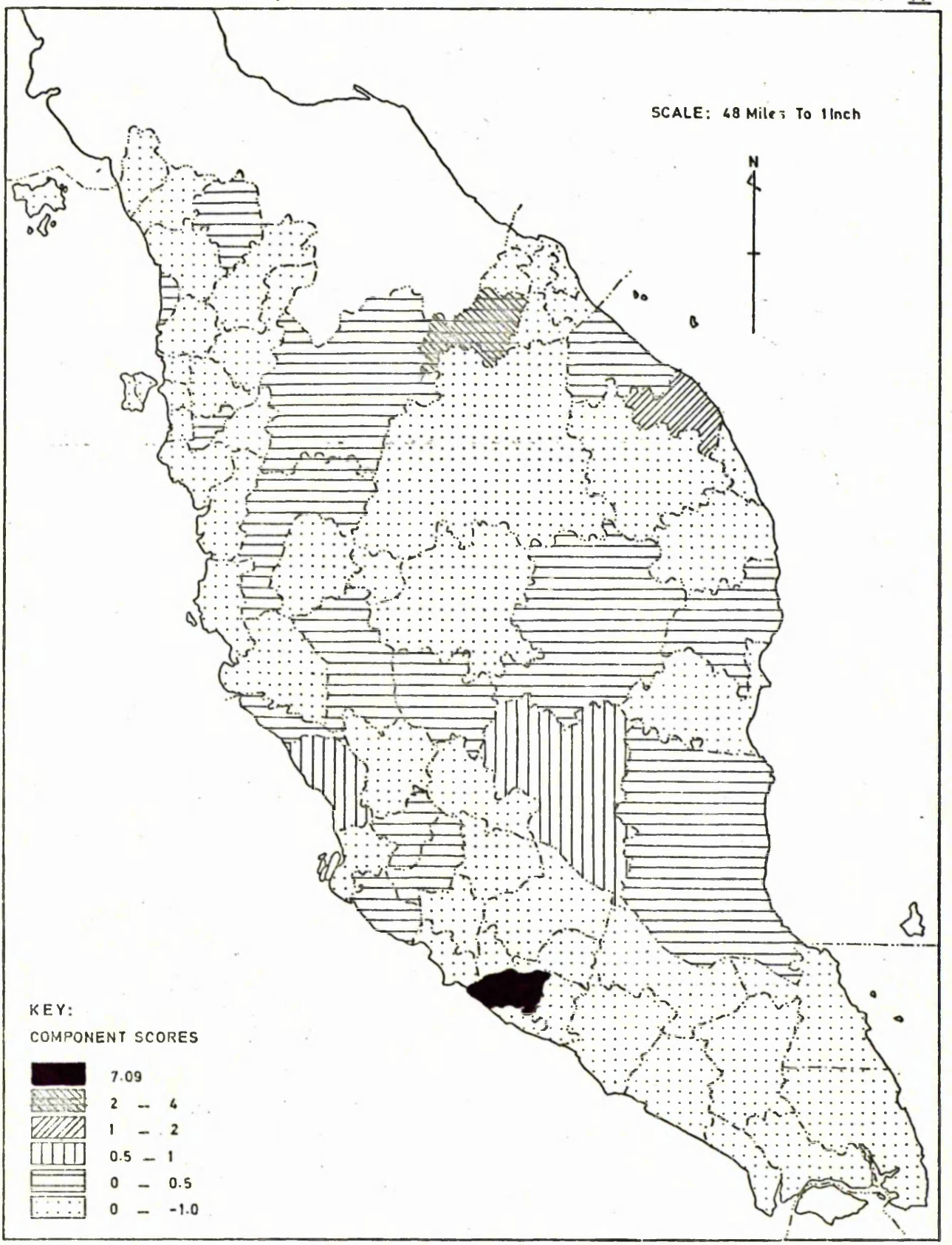
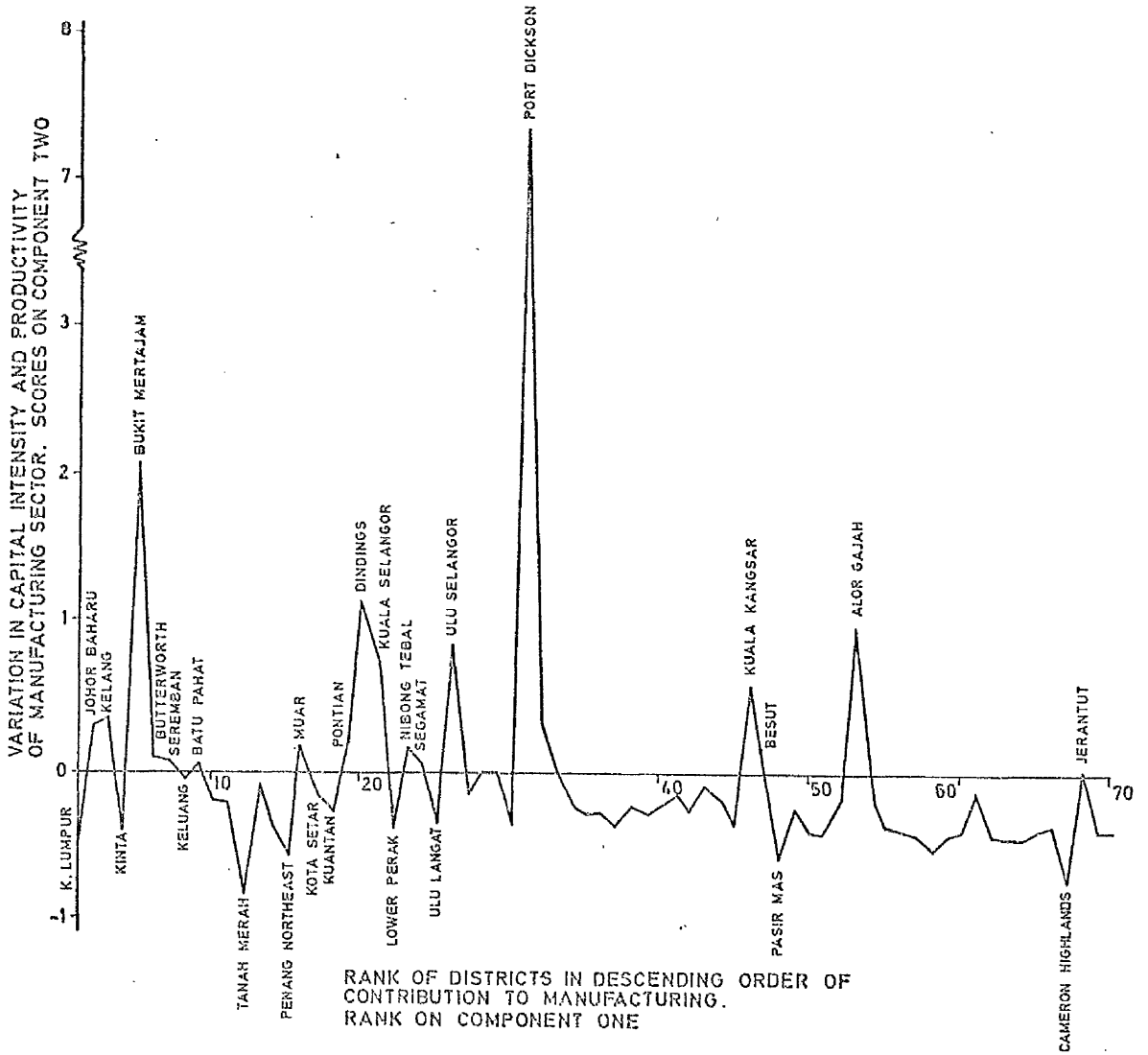


Fig: 6·7 COMPARISON OF SCORES ON CAPITAL INTENSITY + PRODUCTIVITY OF THE MANUFACTURING DISTRICTS WITH DISTRICTS' CONTRIBUTION TO MANUFACTURING, 1970



overlap between the districts' level of manufacturing and the capital intensity and productivity of the districts' manufacturing units. Regardless of their contribution to manufacturing in general, some districts showed up as "kinks" on the trend line denoting capital intensity and productivity, particularly within the first thirty-three ranks.

The explanation for the high ranking manufacturing districts that demonstrate a downward shift on the capital intensity and productivity component is that these districts (Kuala Lumpur, Kinta, and Penang north-east) possess major urban centres that have grown from their initial stages as administrative, commercial and mining centres during the nineteen century. As urban centres, they possess a large number of small manufacturing units which were related to the direct consumption needs of the population. Some of these activities were still being carried on along the traditional small-scale methods. As the towns grew, the tendency for these establishments to increase in number rather than in size, was evident. Modern industry did not make significant inroads into this segment of industry. Modern industry merely added a new component of large size units with capital-intensive techniques of production and well-organised distributive channels to cater for a national market.

The mean value of the fixed assets per establishment in each district was obtained by dividing the total fixed assets of the manufacturing industry by the number of establishments. This tended to give a low value due to

the large number of small establishments. Statistically, the large number of small plants which had lower productivity and fewer capital assets tended to overshadow the small number of large manufacturing units with more capital assets and higher productivity.

Another reason is that the creation of industrial estates in the late 1960's has directed modern large and medium size manufacturing units to these sites. Many of the large units were eager to qualify for financial incentives which, as indicated earlier, tended to favour capital-intensive lines of production. Hence, a situation emerged where districts with successful industrial estates were characterised by the concentration of capital-intensive units. These districts scored highly on Component II. Klang, Bukit Mertajam, Johore Bahru, Butterworth and the Dindings are examples.

The localization of a specific type of capital-intensive industry in a particular district is governed by other factors, such as proximity to a port or to the raw materials. This explains other anomalies in the graph. The location of the petroleum refining industry at Port Dickson and the localization of the pineapple industry at Pontian are two examples.

A comparison of the rank order of districts by the level of manufacturing in 1970 (Rank on Component I) with the rank order by the level of manufacturing in 1968 (based on the mean rank on four indicators - chapter 3) is given in Figure 6.8a. This is substantiated in Figure 6.8b by a graphic charting of the scores of the Districts on the

Fig:6·8a A COMPARISON OF THE RANK ORDER OF DISTRICTS BY THE LEVEL OF MANUFACTURING 1970 (COMPONENT ONE) WITH THE RANK ORDER BY LEVEL OF MANUFACTURING, 1968.

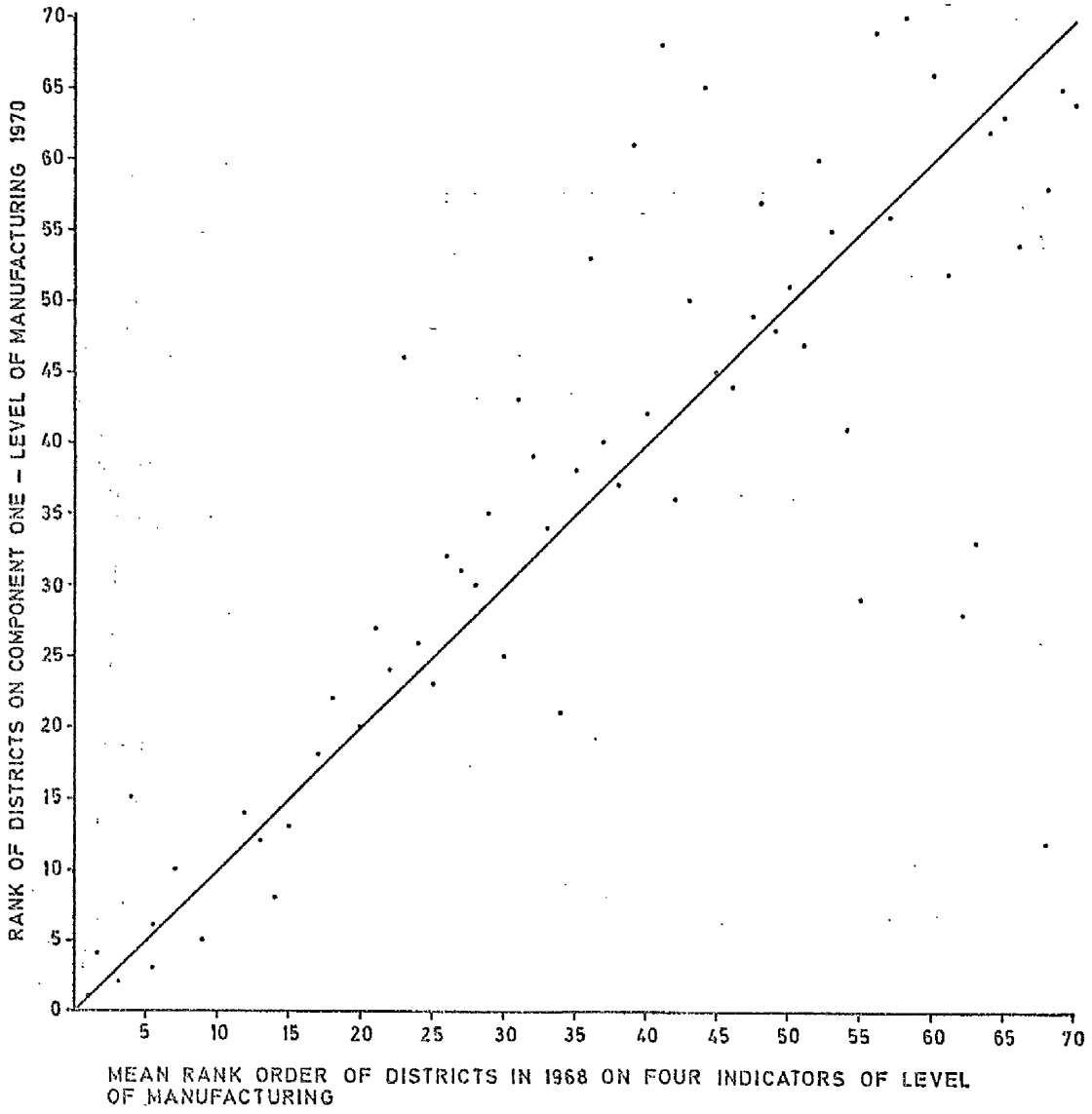
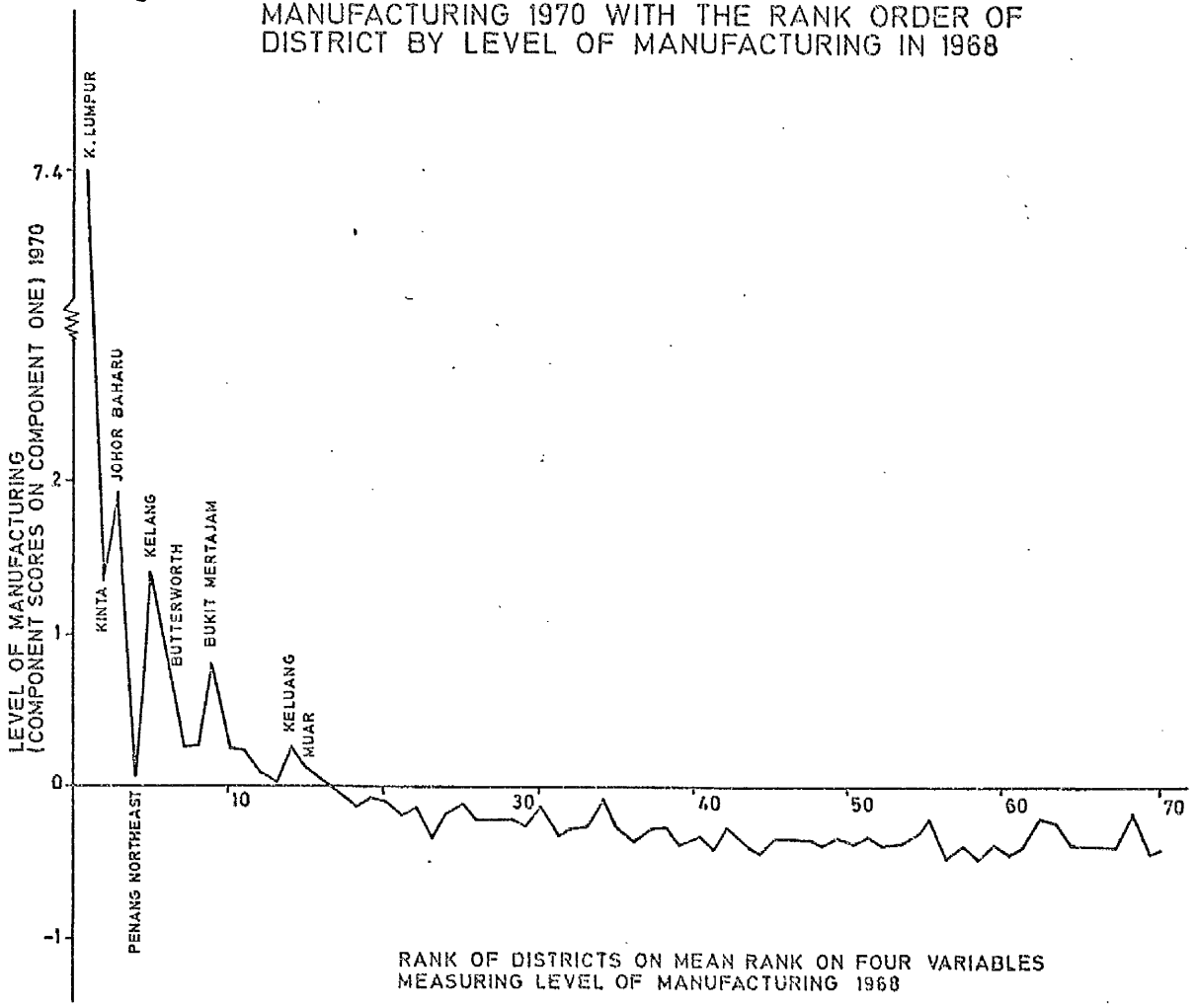


Fig:6·8b A COMPARISON OF THE DISTRICTS LEVEL OF MANUFACTURING 1970 WITH THE RANK ORDER OF DISTRICT BY LEVEL OF MANUFACTURING IN 1968



level of manufacturing, 1970 (Component I) against their ranks based on the level of manufacturing in 1968.

Despite the short time interval some important changes are noteworthy. Only the first sixteen districts in both ranks recorded positive scores by 1970. The remaining ranks conformed to a declining trend line, albeit minor 'peaks'and 'depressions'. The significant changes in the first sixteen ranks were those of Johore Baharu (from the third place to the second place). Bukit Mertajam rose to the fifth place from the ninth place in 1968. Butterworth retained its sixth place. Four districts - Seremban, Kluang, Batu Pahat and Malacca Central achieved almost the same level of industrial development by 1970. They took the seventh to the tenth positions in 1970 with the significant move upward from the 1968 ranks for Kluang and Seremban. Penang north-east lost its position (fourth - in 1968) and moved to the fifteenth position in 1970. It had a component score similar to Kota Star, Kota Bahru, Kuala Muda and Muar.

Among districts with negative scores, an improvement in the relative positions of Tanah Merah, Machang, Bachok, Pasir Puteh and Kubang Pasu - mainly agricultural districts - was noted.

The graph, in general, indicates the beginning of the trend of industrial dispersion to districts in close proximity to the existing industrial centres. This was aided by the location of industrial estates in these districts.

6.3 Potential Impact of Industrial Projects Approved from 1970 to mid 1974 on the Spatial and Structural Pattern of Manufacturing Industry

Data on the progress of the manufacturing sector after the Survey of Manufacturing, 1971 are scarce. The only indicator of the expansion of manufacturing activities is the list of approvals[1] of manufacturing projects from the applications received by FIDA. As there is a time lag between the time when the project is approved and the actual production and operation of the unit, it was considered useful to analyse the approvals from January 1970 since the pattern and structure of industry in 1970 could hardly have been influence by the projects approved in that year.

The data extracted from the records made available by FIDA from January 1970 to the end of June 1974 was in the form of lists of approvals classified by the year of approval, industry group, estimated employment and the likely location of the project. These data thus form the basis of the following analysis.

The number of projects approved for West Malaysia from the applications received by FIDA amounted to 290 in 1970, 211 in 1971, 236 in 1972, 352 in 1973 and 211 in the first half of 1974. The steady increase in the number of

---

1. Projects are approved by FIDA from the applications made by private (local and foreign) investors if the projects are considered viable and in line with the industrial policy. But the final decision as to where to locate rests with the entrepreneur within the constraints of selecting a site in one of the planned industrial estates.

approvals during the period is an important indicator of the steady expansion of manufacturing activity. The slightly lower number of approvals in 1971 was an indication of the caution and uncertainty expressed by applicants to the new industrial policy outlined in the Second Malaysia Plan and published at the end of 1970. But confidence in the climate for investment seemed to have been restored fairly quickly.

The District-level distribution of the approved projects is given in Table 6.10, according to the year of approval of the projects. A preliminary examination shows that there were signs of industrial dispersion, although one-third of the projects approved during the entire period were still channelled into the Klang Valley. The Klang Valley's share of the projects was on the decline from 34.6 per cent in 1970 to 22 per cent in the first half of 1974. Dispersion of newly approved projects to Pontian, Kuala Muda, Kota Star, Malacca Central, Seremban, Kuantan, Pekan, Bukit Mertajam, Penang south-west, Krian, Perlis and Ulu Langat was noted.

At this point further analysis is undertaken by comparing graphically, the district-level distribution of approvals for each of the four years and for the entire period with the rank order of districts by their level of manufacturing in 1970 (Component I).

Figure 6.9 provides this comparison for the approvals of 1970 and 1971. The dominance of the nine top-ranking districts as locational choice of the approved industrial projects was clearly marked. The order of

Table 6.10. DISTRICT-LEVEL DISTRIBUTION OF APPROVED PROJECTS IN THE MANUFACTURING INDUSTRY, 1970 TO JUNE 1974.

District Chosen for Siting Project	Year of Approval 1970		1971		1972		1973		Mid 1974		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Not specified	53	18.4	20	9.5	12	5.1	9	2.6	5	2.4	99	7.6
Batu Pahat	9	3.1	4	1.9	4	1.8	1	0.3	3	1.4	21	1.6
Johore Bahru	30	10.4	24	11.3	27	11.4	26	7.4	21	10.0	128	9.8
Kluang*	2	0.7	-	0.0	-	0.0	3	0.9	1	0.5	6	0.5
Kota Tinggi*	-	0.0	2	0.9	1	0.4	-	0.0	1	0.5	4	0.3
Mersing	-	0.0	-	0.0	1	0.4	-	0.0	1	0.5	2	0.2
Muar	2	0.7	3	1.4	1	0.4	2	0.5	5	2.4	13	1.0
Pontian	1	0.3	0	0.0	3	1.4	5	1.4	2	1.0	11	0.8
Segamat	0	0.0	0	0.0	0	0.0	0	0.0	1	0.5	1	0.1
Baling*	1	0.3	-	0.0	-	0.0	-	0.0	-	0.0	1	0.1
Kota Star*	2	0.7	1	0.5	2	0.8	3	0.9	4	1.9	12	0.9
Kuala Muda	2	0.7	1	0.5	3	1.4	8	2.3	10	4.8	24	1.8
Kubang Pasu*	1	0.3	0	0.0	-	0.0	-	0.0	1	0.5	2	0.2
Padang Terap*	-	0.0	-	0.0	-	0.0	-	0.0	1	0.5	1	0.1
Kota Bahru	-	0.0	1	0.5	-	0.0	1	0.3	1	0.5	3	0.2
Pasir Mas*	-	0.0	-	0.0	-	0.0	-	0.0	1	0.5	1	0.1
Tanah Merah*	-	0.0	1	0.5	-	0.0	1	0.3	-	0.0	2	0.2
Alor Gajah	-	0.0	-	0.0	-	0.0	1	0.3	2	1.0	3	0.2
Jasin	-	0.0	-	0.0	-	0.0	-	0.0	2	1.0	2	0.2
Malacca Central	1	0.3	4	1.9	5	2.1	22	6.3	12	5.7	44	3.4
Jelebu	-	-	-	-	-	-	-	-	1	0.5	1	0.1
Kuala Pilah	-	-	1	0.5	1	0.4	1	0.3	2	1.0	5	0.4
Port Dickson	1	0.3	-	-	-	-	-	-	1	0.5	2	0.2
Seremban	6	2.2	9	4.3	10	4.3	11	3.1	1	0.5	37	2.8
Tampin	-	-	-	-	-	-	-	-	1	0.5	1	0.1
Kuantan	1	0.3	1	0.5	2	0.8	4	1.1	3	1.4	11	0.8
Pekan*	1	0.3	-	-	-	-	2	0.5	2	1.0	5	0.4
Raub*	1	0.3	-	-	-	-	-	-	-	-	1	0.1
Termeloh*	2	0.7	1	0.5	-	-	-	-	1	0.5	4	0.3
Bukit Mertajam	18	6.2	19	9.0	17	7.2	51	14.5	24	11.4	129	9.9
Butterworth	16	5.5	9	4.3	9	3.8	2	0.5	5	1.9	41	3.2
Nibong Tebal	1	0.3	2	0.9	1	0.4	4	1.1	-	-	8	0.6
Penang N.E.	-	-	1	0.5	6	2.5	3	0.9	1	0.5	11	0.8
Penang S.W.	3	1.0	5	2.4	17	7.2	13	3.7	7	3.3	45	3.5
Batang Padang	2	0.7	-	-	2	0.8	1	0.3	-	-	5	0.4
Dindings	-	-	2	0.9	2	0.8	2	0.5	-	-	6	0.5
Kinta	22	7.6	10	4.7	10	4.3	16	4.6	13	6.2	71	5.5
Krian	-	-	-	-	1	0.4	9	2.6	8	3.7	18	1.8
Kuala Kangsar	-	-	-	-	-	-	1	0.3	4	1.9	5	0.4
Larut Matang	5	1.7	7	3.3	2	0.8	10	2.9	3	1.4	27	2.1
Lower Perak	2	0.7	1	0.5	2	0.8	-	-	1	0.5	6	0.5
Perlis*	1	0.3	2	0.9	1	0.4	3	0.9	2	1.0	9	0.7
Klang	44	15.3	39	18.4	36	15.4	48	13.7	17	8.1	184	14.2
Kuala Langat	-	-	1	0.5	1	0.4	1	0.3	1	0.5	4	0.3
Kuala Lumpur	56	19.3	34	16.1	51	21.7	74	20.8	30	14.3	245	18.8
Kuala Selangor	-	-	-	-	1	0.4	1	0.3	1	0.5	3	0.2
Sabak Bernam	-	-	-	-	-	-	1	0.3	-	-	1	0.1
Ulu Langat	1	0.3	1	0.5	1	0.4	4	1.1	3	1.4	10	0.8
Ulu Selangor	1	0.3	3	1.4	1	0.4	3	0.9	4	1.9	12	0.9
Besut*	-	-	1	0.5	-	-	-	-	-	-	1	0.1
Dungun*	-	-	-	-	1	0.4	2	0.5	-	-	3	0.2
Kemaman*	1	0.3	1	0.5	1	0.4	1	0.3	0	-	4	0.3
Kuala Trengganu*	-	-	-	-	-	-	2	0.5	1	0.5	3	0.2
Marang*	-	-	-	-	1	0.4	-	-	-	-	1	0.1
Ulu Trengganu*	1	0.3	-	-	-	-	-	-	-	-	1	0.1
Total	290	99.9	211	100.0	236	100.0	352	100.0	211	100.0	1300	

Sum of square = 748.05
Degress of freedom = 385
Significance = 0.0

* Districts that are designated as 'Development Areas' for Locational Incentives.

importance, however, was straddled with 'peaks' and 'depressions' within a descending trend line. The residue of approvals was thinly and unevenly spread out to as far down as the district ranked fifty-three. Beyond this rank the only exception was Penang south-west. As a favourite locational choice it reflected the attraction of investors to the newly created free trade zone at Bayan Lepas.

In 1971, the nine top-ranking districts attracted fewer approved projects with the result that dispersion effects were more pronounced. Dispersion of industry to Kota Tinggi, Penang south-west, Larut/Matang, Muar and Kota Tinggi were displayed as 'kinks' in Figure 6.9.

It has to be emphasised that within the Klang Valley and Johore Bahru, preference for these districts was indicative of intra-district dispersion of industry. The planning and the creation of new towns, free trade zones (Sungei Way and Ulu Klang) and industrial estates (Setapak, Batu Caves, Ulu Klang, Pandamaran) shifted the emphasis from the existing industrial estates of Petaling Jaya and Shah Alam to the new sites in the Klang Valley. In Johore Bahru district a similar trend was taking place with the requests by approved projects for sites in Pasir Gudang.

The process of dispersion gained momentum in 1972 and 1973 as shown in Figure 6.10. In 1972, while the districts of Klang and Kuala Lumpur maintained first and second places as sites for approvals, they were closely followed by Johore Bahru, Bukit Mertajam and Penang south-west. The last two districts emerged as important sites in the north for approved industrial projects.

Fig:6.9 A COMPARISON OF THE DISTRIBUTION OF PROJECTS APPROVED IN 1970 AND 1971 WITH THE RANK ORDER OF DISTRICTS BY THEIR CONTRIBUTION TO MANUFACTURING 1970

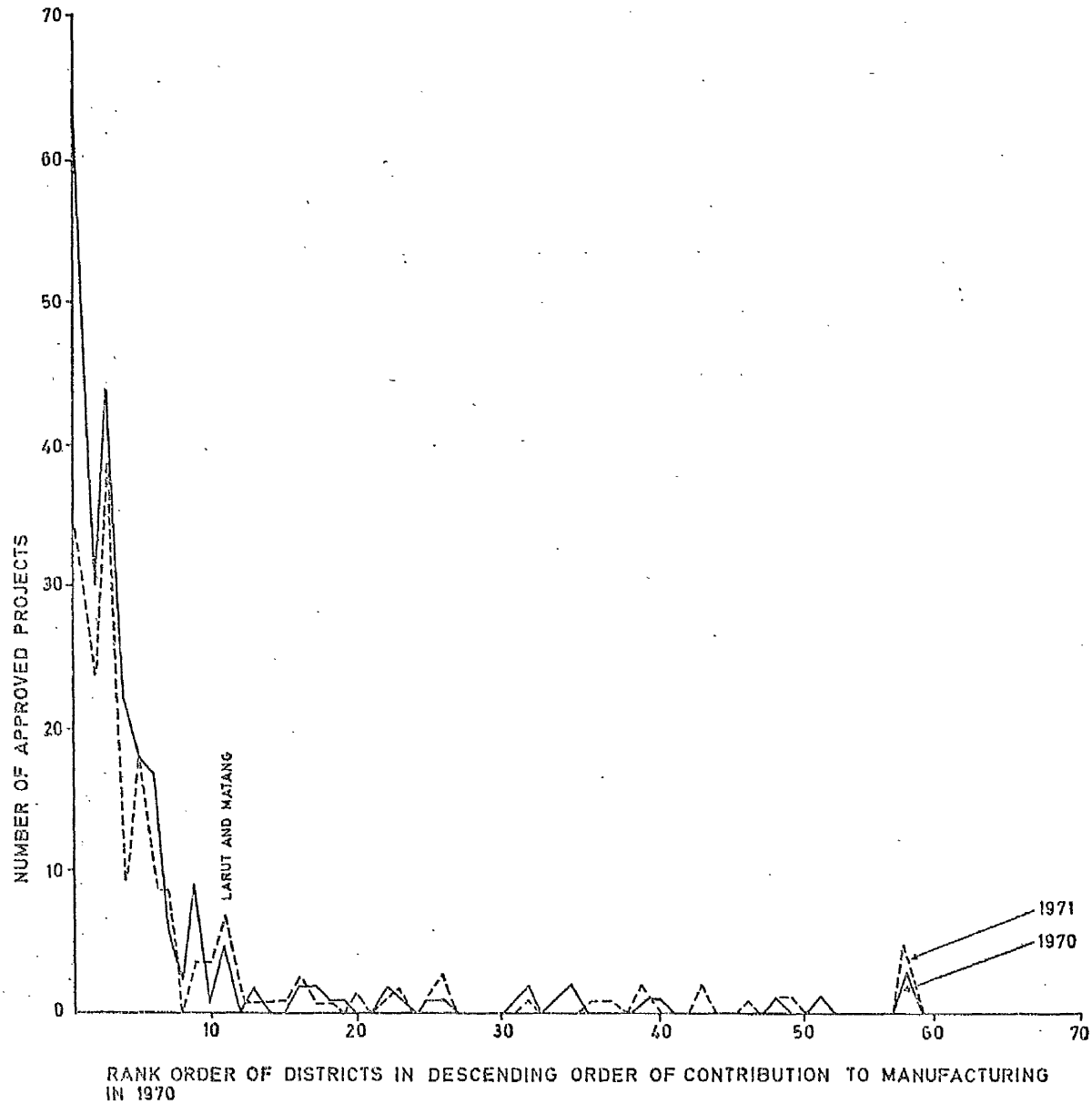
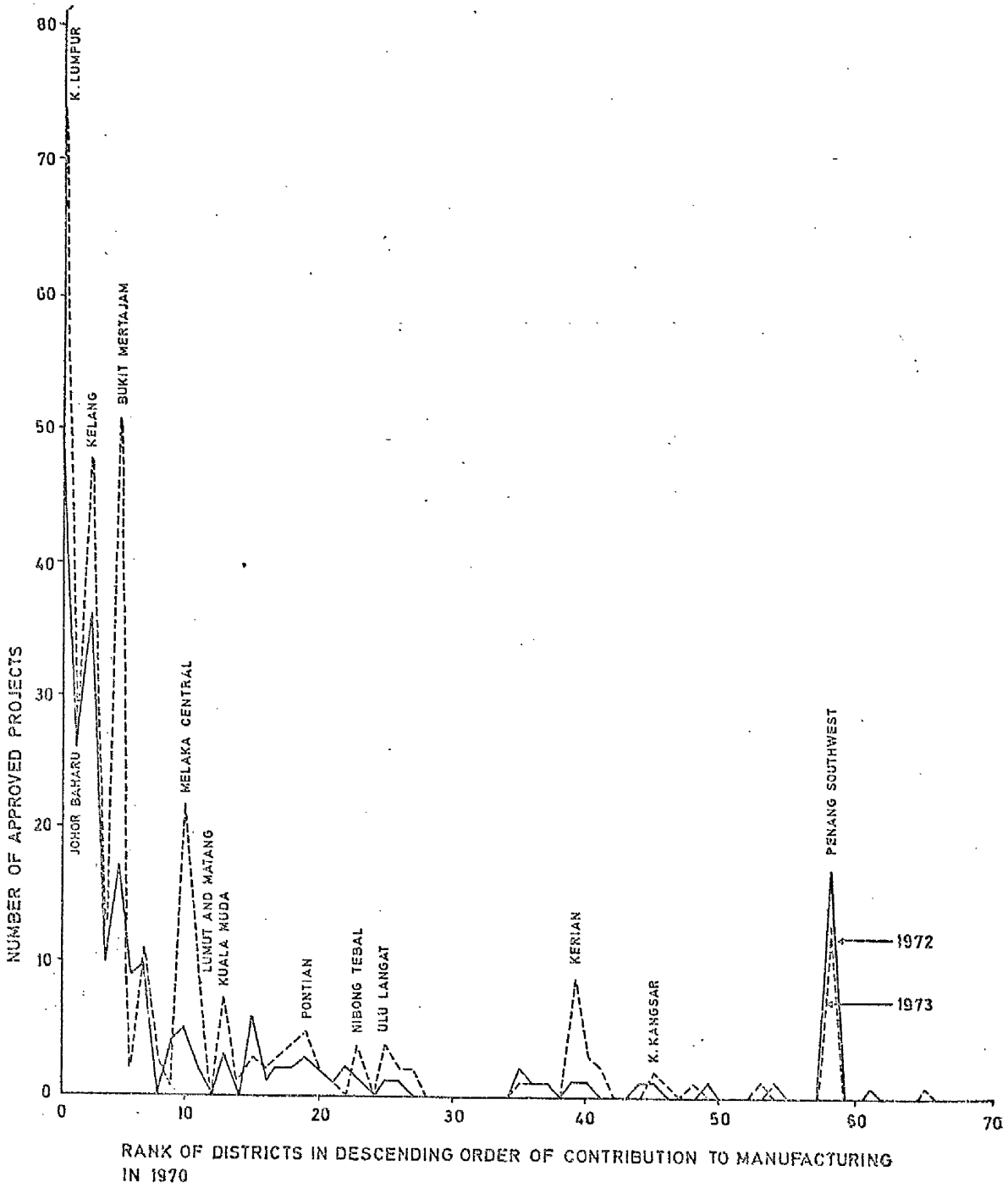


Fig:6.10 A COMPARISON OF DISTRIBUTION OF MANUFACTURING PROJECTS APPROVED IN 1972 AND 1973 WITH THE RANK ORDER OF DISTRICTS BY THEIR CONTRIBUTION TO MANUFACTURING IN 1970



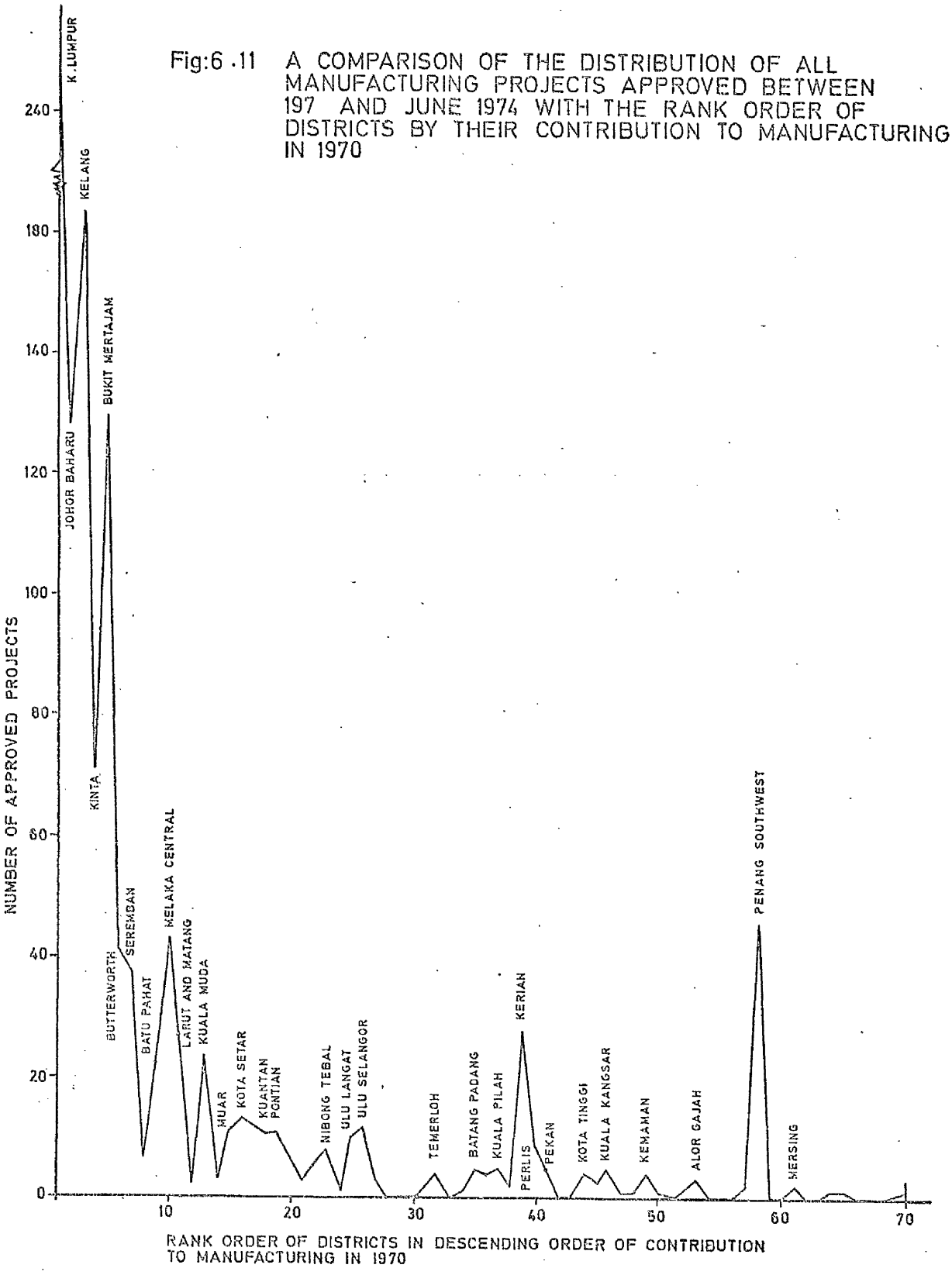
Bukit Mertajam ranked fourth in terms of the number of approvals likely to be located in that district. It was followed by Seremban, Butterworth, Penang South-west, Malacca Central and Batu Pahat in that order of importance.

In 1973, Bukit Mertajam obtained the second largest number of approvals, next to Kuala Lumpur. Klang followed in third place while Malacca Central took fifth place. Significant numbers of approvals chose Kuala Muda, Krian, Penang South-west, Pontian, Nibong Tebal and Ulu Langat.

The full impact of the process of industrial dispersion which has been outlined for each year is summarised in Figure 6.11. It compares the distribution of all approved projects (1970 to mid 1974) with the rank order of districts by their level of manufacturing in 1970.

The Klang valley stood out as the most attractive locational site for manufacturing industry. It was distinctly superior to all other locations, judged by the number of approvals it attracted. Industrial estates and free trade zones planned and developed later than those in other districts were speedily being taken up by approvals. During the period, the district of Bukit Mertajam also emerged as an important site, next in importance to the Klang Valley. It surpassed the importance of Johore Bahru and Kinta districts, although in 1970 the latter two districts held higher ranks on the level of manufacturing achieved. This situation also throws light on the industrial structure. It indicates that industrial linkage with its theoretical emphasis on external economies of location

Fig:6 .11 A COMPARISON OF THE DISTRIBUTION OF ALL MANUFACTURING PROJECTS APPROVED BETWEEN 197 AND JUNE 1974 WITH THE RANK ORDER OF DISTRICTS BY THEIR CONTRIBUTION TO MANUFACTURING IN 1970



assumed an inferior position. Perhaps the product-mix or the nature of the industry attracted was a contributary factor.

Outstanding achievement in dispersion was shown by Penang south-west. It ranked fifty-eighth on the level of manufacturing in 1970, but it was sixth in terms of numbers of projects it attracted. Malacca Central took seventh place in terms of projects likely to be located there. Krian was another district which obtained the eighth place. It disrupted the descending trend line of the graph of dispersals. It ranked thirty-ninth on the level of manufacturing in 1970. Larut/Matang, Kuala Muda, Muar, Penang North-east, Ulu Selangor, Ulu Langat and Perlis also contributed to industrial dispersion by attracting a substantial number of approved projects.

In the east coast, Kuantan, Termeloh and Kemaman took a moticeable 'slice' of the projects. Apart from these three districts the impact of the dispersal of projects is hardly noticeable graphically and hence would appear to be hardly effective in bringing about changes to the existing economic structure.

The above analysis fails to provide adequate information on the east-coast districts. They tend to be overshadowed by districts with rapid growth. An attempt is made to explore further into the level of dispersion of industry, its spatial impact and the causal factors contributing to the pattern discussed above. The approved projects were regrouped by the year of approval according to the eight groups of districts of descending order of

contribution to manufacturing in 1970. The groups are tabulated in Table 6.11. The ninety-nine projects which were locationally unspecified are listed separately.

A close examination of the Table 6.11 shows that the degree of dispersion of industry was more apparent than real. The three leading groups of districts (grouping was based on the level of manufacturing attained) attracted 64 per cent of all the approved projects between 1970 and mid 1974. These three groups consisted of only six districts out of the seventy districts in West Malaysia. Their share of approved projects declined slightly (61 per cent) in 1973. In the first half of 1974 their share of approved projects amounted to 52 per cent. This shows that there was a decline in the proportion of newly approved projects that were likely to be located in these districts. Nevertheless, the locational attractiveness of these districts tended to counteract the move to decentralise manufacturing industry.

The remaining groups of districts indicated a positive trend in dispersion. Groups four, five and six recorded a modest increase of two per cent each in the number of projects likely to be located within the period. Groups seven and eight depicted higher increases, particularly group eight. The performance of districts in group eight reflected mainly the success of four districts in attracting approved projects. These were: Penang southwest, Krian, Perlis and Kemaman.

Table 6.11 DEGREE OF DISPERSION OF APPROVED PROJECTS INTO THE EIGHT GROUPS OF DISTRICTS IN DESCENDING ORDER OF IMPORTANCE ON THE MANUFACTURING SCALE IN 1970

Group of District by level of manufacturing	Districts		Number and % of Approved Projects 1970–1974											
			1970		1971		1972		1973		First half of 1974		1970 - First half of 74	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Unspecified location			53	18.3	20	9.5	12	5.1	9	2.6	5	2.4	99	7.6
Group I	1	1.4	56	19.4	34	16.1	51	21.6	74	20.7	30	14.2	245	18.8
Group II	3	4.3	96	33.2	73	34.6	73	30.9	90	25.6	51	24.2	383	29.5
Group III	2	2.9	35	11.7	28	13.3	26	11.0	53	15.1	28	13.3	170	13.2
Group IV	4	5.7	18	6.3	17	8.1	19	8.0	37	10.6	17	8.1	108	8.3
Group V	4	5.7	7	2.4	10	4.7	5	2.1	20	5.7	14	6.6	56	4.3
Group VI	3	4.3	4	1.4	5	2.4	9	3.8	8.	2.4	10	4.7	36	2.7
Group VII	18	25.7	13	4.5	11	5.2	15	6.4	25	7.1	17	8.0	81	6.2
Group VIII	35	50.0	8	2.8	13	6.1	26	11.1	36	10.2	39	18.5	122	9.4
Total	70	100	290	100	211	100.0	236	100.	352	100.	211	100	1300	100

A Lorenz curve[1] is constructed for each of the five years to measure the degree of dispersion of approved projects among the eight groups of districts (grouped according to the level of manufacturing in 1970). The Lorenz curves are shown in Figure 6.12. In a Lorenz curve, if there is maximum dispersion the curve will coincide with the 45 degree line joining AC. Hence the area ABC measures the maximum dispersion that can occur.[2] Thus this provides the basis against which all other areas can be compared. The index of maximum dispersion is logically 1.00. The area bounded by the curve is then compared with the area ABC to obtain the index of dispersion. If the dispersion is high, the index will approximate one.

An index of dispersion for the groups of districts measured on the basis of project approvals amounted to 0.24 in 1970 (Figure 6.12). By mid 1974 the index of 0.35 was achieved. This change indicates a positive trend towards dispersion outwards from the main centres of industrial concentration.

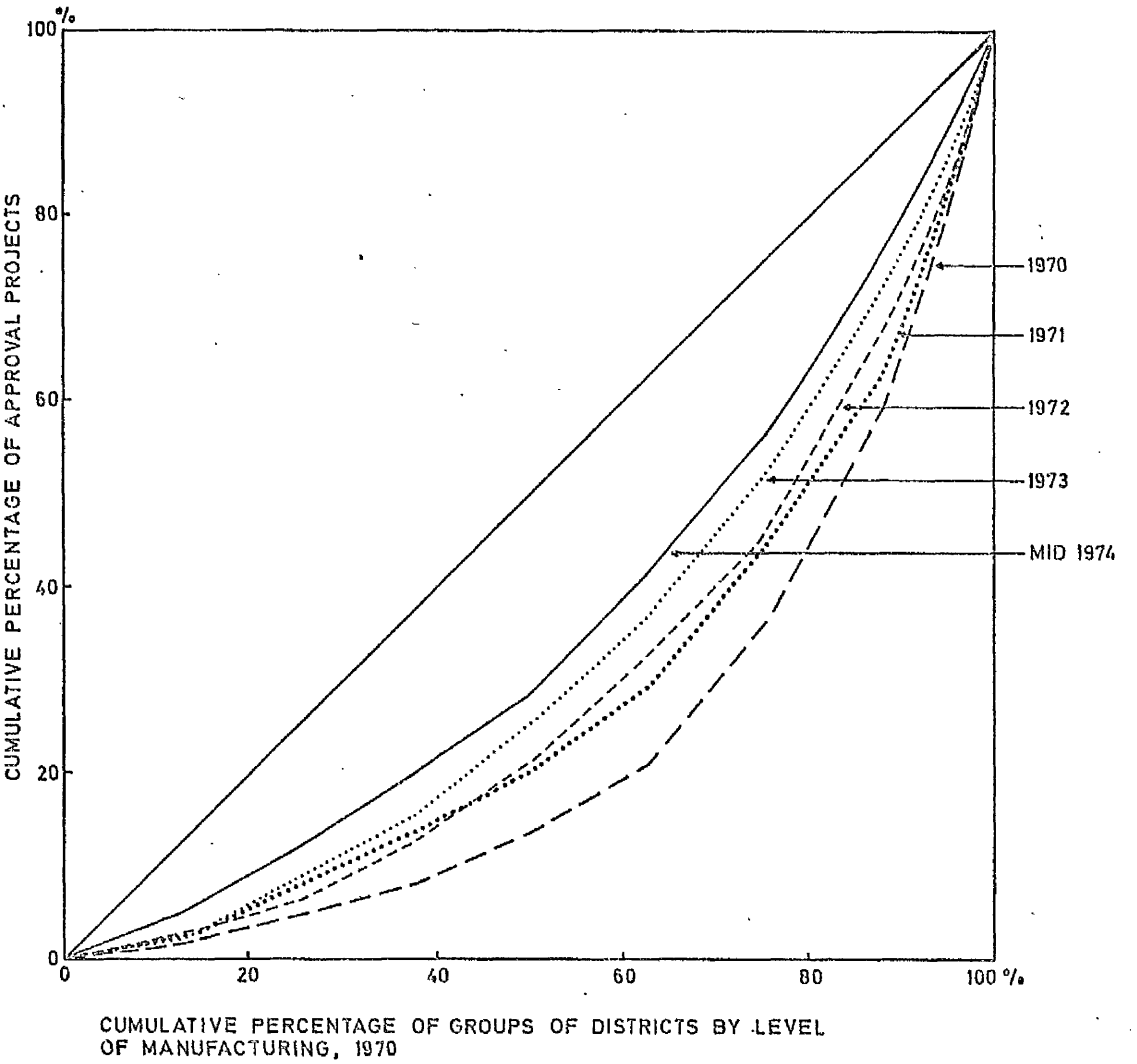
It was referred to in chapter four that certain areas were designated "Development Areas" under the new industrial policy. Industrialists are eligible for

---

1. The use of the Lorenz curve in the above analysis of industrial dispersion is adopted from the work of Edgar C. Conkling, South Wales, A Case study of Industrial Diversification, Economic Geography, Vol. 39, 1963, P. 258-232.

2. Maurice, Yeates H. An Introduction to Quantitative Analysis in Economic Geography, McGraw-Hill Book Company, 1968, P. 92 and 95.

Fig:6.12 LORENZ CURVES FOR INDUSTRIAL DISPERSION OF NEWLY APPROVED PROJECTS IN SPATIAL GROUPS OF DIFFERENT LEVELS OF MANUFACTURING 1970.



locational incentives if they locate their plants in these districts, as a measure to counteract the less attractive nature of the sites in these areas.

Specific locational incentives were introduced only in 1973 and would not make a significant impact on the locational decisions of the period in question. However, the impact of approvals on designated Development areas would be an interesting aspect of this analysis on industrial dispersion.

To find out how districts designated as Development areas fared in the process of industrial dispersion, approved projects were classified according to their location in Development areas and non-Development areas. This breakdown is given in Table 6.12. Only 19 districts of the 34 districts, which were designated Development areas, were listed as sites selected by approved projects. In 1970 only twelve projects were recorded for location in Development areas. The numbers declined in 1971 and in 1972. In 1973, eighteen projected were listed for location in Development areas while by mid 1974 another sixteen were added. Thus of the 1201 projects for which possible locations were specified, only 64 projects (4.9 per cent) were likely to be located in Development areas.

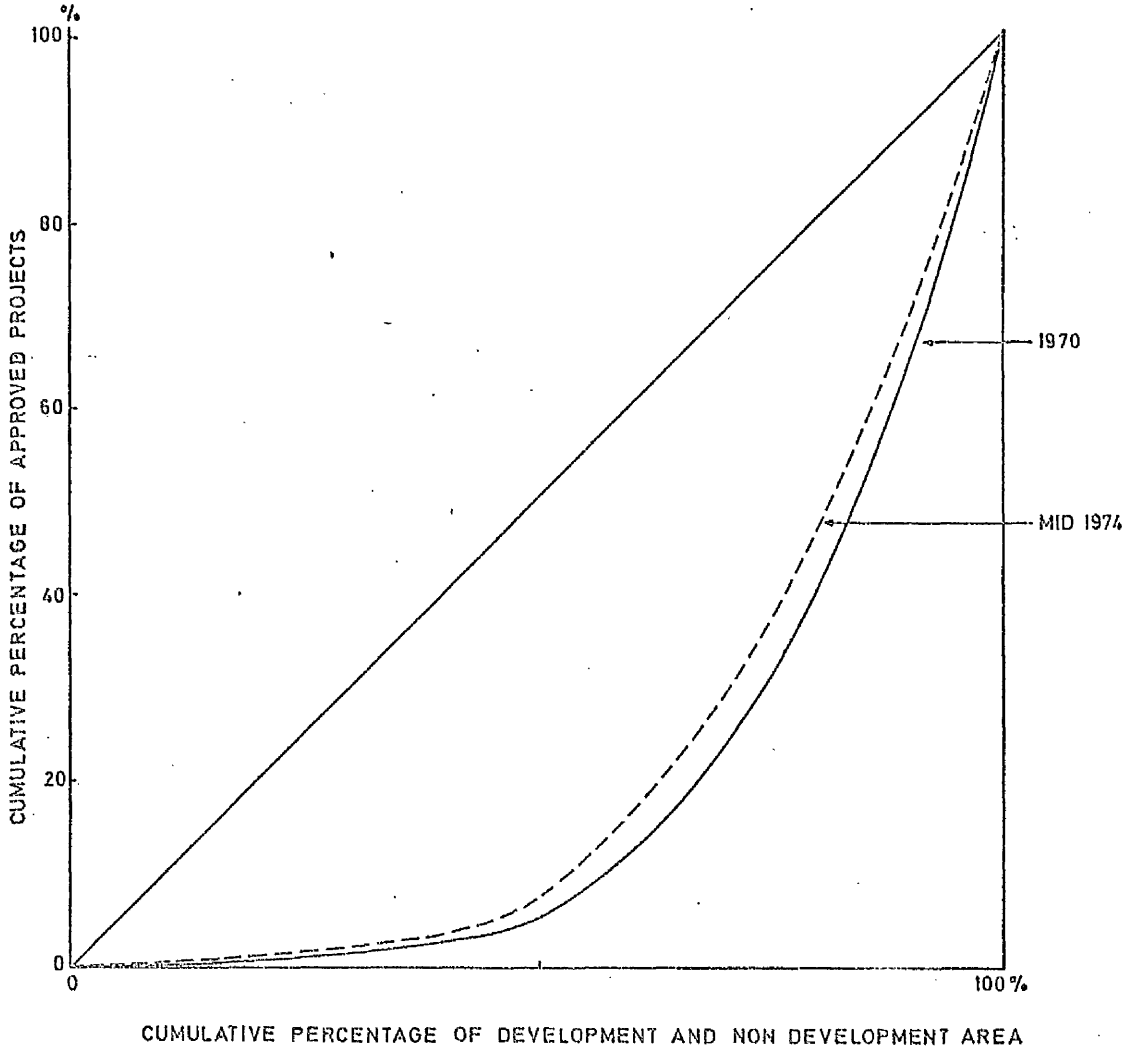
Lorenz curves depicting the dispersion of approved projects in Development and non Development areas in 1970 and at the end of the period (mid 1974) are drawn (Figure 6.13). The index of dispersion in 1970 amounted to 0.207. It amounted to 0.234 by mid 1974 indicating an improvement on the index by 0.027.

Table 6.12 COMPARISON OF DISPERSION OF APPROVED PROJECTS IN AREAS DESIGNATED - DEVELOPMENT AREAS AND OTHER AREAS

		1970		1971		1972		1973		1974		1970-74	
Districts		No	%	No	%	No	%	No	%	No	%	No	%
Development Areas	34	12	4.1	11	5.2	7	3.0	18	5.1	16	7.6	64	4.9
Other Areas	36	225	77.6	180	85.3	217	91.8	325	92.3	190	90.0	1137	87.5
Unspecified location		53	18.3	20	9.5	12	5.1	9	2.6	5	2.4	99	7.6
Total		290	100	211	100	236	100	352	100	211	100	1300	100

Although Development Areas Consist of 34 districts, but of these only 19 districts were listed as likely sites for approved projects in the 1970 to mid 1974 period while 35 of the 36 other districts are listed as likely sites for the approved projects.

Fig:6.13 LORENZ CURVES SHOWING THE DISPERSION OF NEWLY APPROVED INDUSTRIAL PROJECTS IN DISTRICTS CLASSIFIED 'DEVELOPMENT AREA' AND 'NON DEVELOPMENT AREA'.



This analysis emphasises the preference by industrialists, for predominantly West coast locations. Furthermore, locations preferred, were not only outside Development areas, but were those that presented the best combinations of the factors of location.

The indices of dispersion of Development Areas and non-Development Areas for 1970 and mid 1974 are compared graphically in Figure 6.14 with the indices of dispersion for areas classified according to their level of manufacturing in 1970. The general trend of the graphs suggests that industry was being dispersed much more rapidly outside the designated Development Areas and that this rate was being achieved over and above their higher level of contribution to manufacturing in 1970. The implications of these trends on development in the present and the future and on industrial policy would be discussed later.

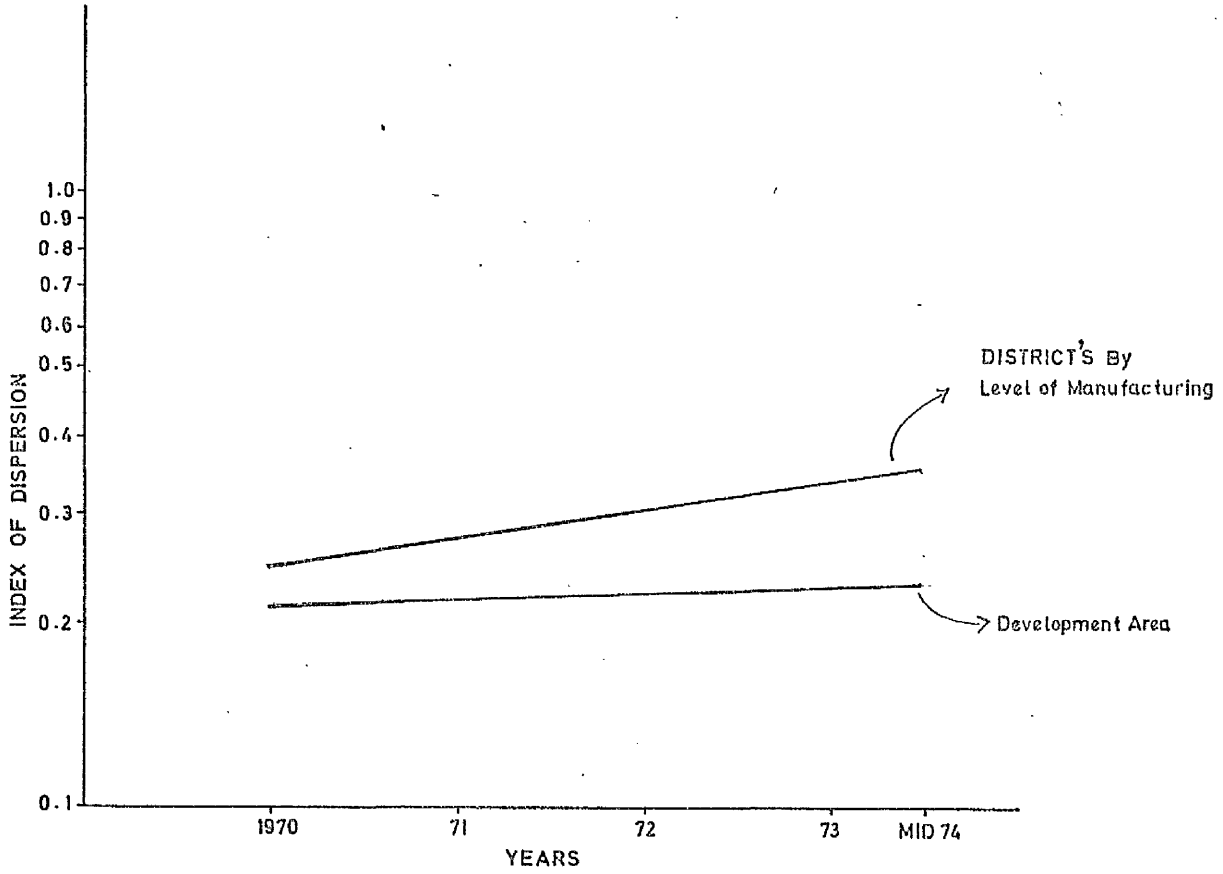
With the exception of locational incentives which apply to designated Development Areas all industrial projects irrespective of location are eligible to apply for incentives. They are granted incentives if they satisfy the qualifying terms laid down. From 1970 to mid 1974, 44.8 per cent of the projects approved intended to operate without incentives. The rest were granted some form of incentive. The most common being pioneer status and incentives to encourage export-oriented industry.[1]

---

1. Pioneer status incorporates relief from income tax (at the rate of 40 per cent of taxable income) and from the payment of the 5 per cent development tax. The terms and the duration of tax exemption has been outlined in chapter three. Incentives for the promotion of export-oriented industry includes similar incentives but for a

Continued on following page...

Fig:6.14 A COMPARISON OF THE INDICES OF INDUSTRIAL DISPERSION OF APPROVED PROJECTS FOR 1970 AND MID 1974 BETWEEN DEVELOPMENT AREA AND ALL DISTRICTS OF WEST MALAYSIA CLASSIFIED ACCORDING TO THE LEVEL OF MANUFACTURING IN 1970



These two incentives were granted to 45.3 per cent of all approved projects. Investment tax credit[1] was granted to 6.7 per cent of the approvals, while labour utilization relief (LUR)[2] was granted to 2.5 per cent of the projects. The low percentage of projects granted LUR indicate its limited success in encouraging labour-intensive industry. It also reflects the fact that this incentive had recently been introduced and its full impact had not been realised. Other incentives[3] constituted only 0.8 per cent of the approvals.

Footnote 1 continued from previous page:

longer duration of four to seven years instead of two to five years. This is provided for by the Amendments to the Investment Incentives Act of 1968. The addition of three years for Priority Product, Development Area and Local Content is also applicable to the export-promotion incentives, thus enabling the specified export-oriented project, meeting all the above conditions, to qualify for up to ten years of tax relief. Extracted from, Federal Industrial Development Authority. 'All About Investment Incentives', 1973, p. 1 and 3.

1. Investment tax credit (ITC) allows a company to deduct from its taxable income the sum of at least 25 per cent of the sum spent on fixed assets.

2. Labour Utilization Relief (an alternative to Pioneer Status and ITC) provides exemption from income tax based on the number of full-time paid employees engaged in the project instead of the amount of capital expenditure incurred. The terms have been outlined in Chapter 4.

3. Other incentives include: Increased Capital Allowance (ICA) which is granted to projects that the Government deems to be desirable in the national interest but which cannot qualify for the incentives outlined above. It applies to qualifying building and plant expenditure incurred in modernising production techniques or setting up a modern factory by a resident company. ICA is calculated as follows:- for qualifying plant expenditure, the annual allowance is 40 per cent; - for qualifying building expenditure incurred on the construction of a building the ICA is 3 per cent of that expenditure; - for qualifying building expenditure incurred on the purchase of a building, the percentage allowed is multiplied by 1½ of the permitted fraction. Ibid., P. 10 and 11.

The spatial distribution of approvals with incentives and without incentives is summarised in Table 6.13. It shows, to some extent, the lack of co-ordination in the implementation of the objectives of the industrial policy.

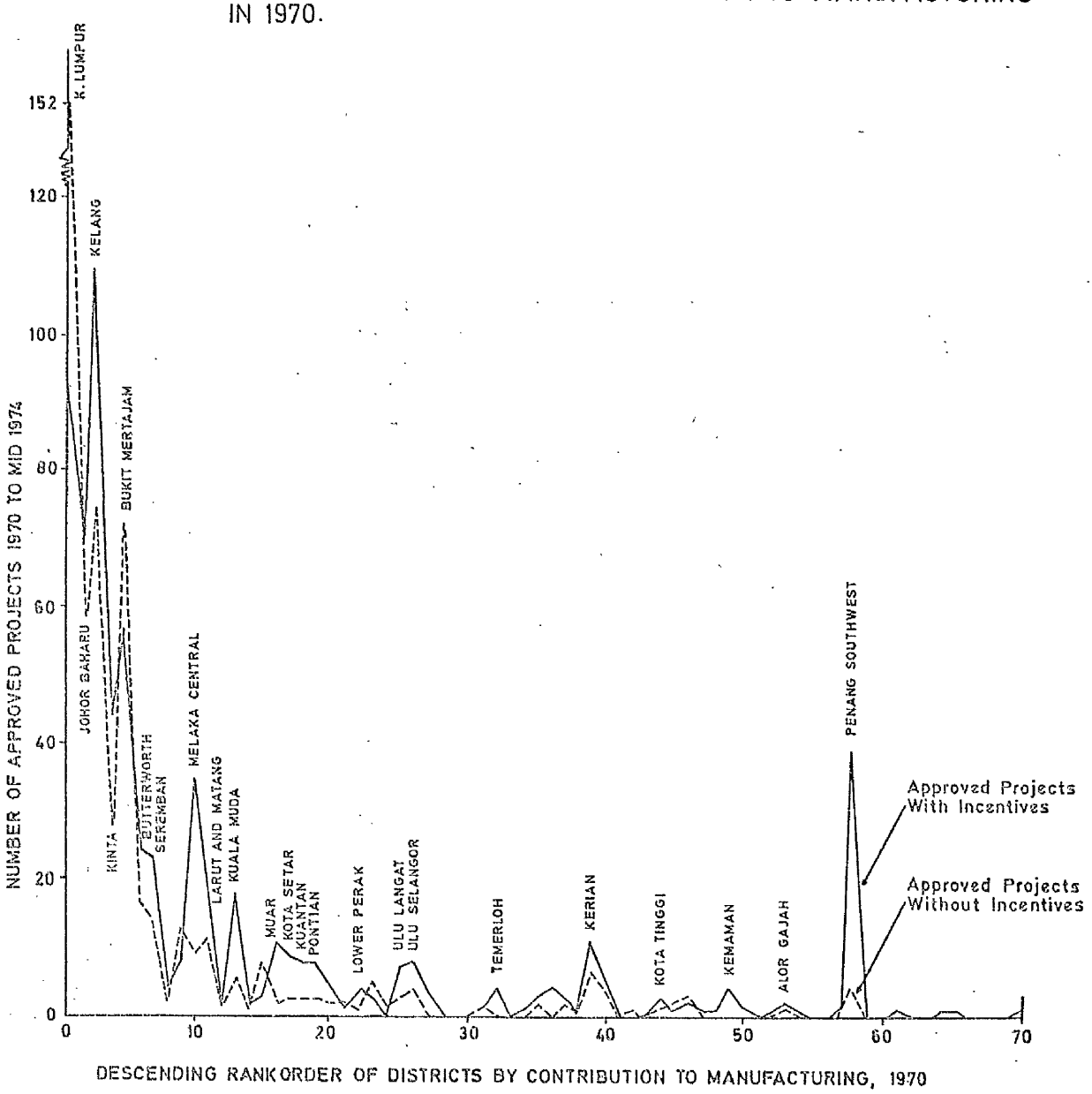
Only fifteen districts had five or more establishments without incentives compared with nineteen districts with five or more projects approved with incentives. In another thirty districts approvals with incentives numbered one to four compared with twenty-four districts with one to four approvals without incentives. While it is evident that at the lower end of the scale incentives had been instrumental in directing industry to the less favoured districts, they appear to have only "scratched the surface" and the role of incentives as a device for dispersing industry from areas of concentration, leaves much to be devised.

Figure 6.15 charts the distribution of approved projects with and without incentives by the rank order of districts on their level of manufacturing in 1970. The graphs show that only five districts attracted a larger number of approved projects without incentives compared with the number of projects approved with incentives for the entire period (1970 to mid 1974). These districts were Kuala Lumpur, Bukit Mertajam, Batu Pahat, Penang north-east and Nibong Tebal. All of them were not the top-ranking districts according to the 1970 level of manufacturing. What is more striking is that districts which ranked highly on the 1970 level of manufacturing have attracted the largest proportion of incentive-granted approvals. The

Table 6.13. DISTRIBUTION OF APPROVED MANUFACTURING PROJECTS BY INCENTIVES GRANTED 1970 TO MID 1974

Districts	Without Incentives		Pioneer Status & Incentives for Export		Investment Tax Credit		Labour Utilization Relief		Other Incentives		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Not Specified	52	8.9	39	6.6	8	9.2	-	-	-	-	99	7.6
Batu Pahat	13	2.2	7	1.2	1	1.1	-	-	-	-	21	1.6
Johore Bahru	59	10.1	53	9.0	12	13.8	3	9.4	1	10.0	128	9.8
Kluang	3	0.5	2	0.3	1	1.1	-	-	-	-	6	0.5
Kota Tinggi	1	0.2	1	0.2	2	2.3	-	-	-	-	4	0.3
Mersing	1	0.2	1	0.2	-	-	-	-	-	-	2	0.2
Muar	2	0.3	7	1.2	2	2.3	2	6.3	-	-	13	1.0
Pontian	3	0.5	6	1.0	1	1.1	1	3.1	-	-	11	0.8
Segamat	1	0.2	-	-	-	-	-	-	-	-	1	0.1
Baling	-	-	-	-	1	1.1	-	-	-	-	1	0.1
Kota Star	3	0.5	8	1.4	1	1.1	-	-	-	-	12	0.9
Kuala Muda	6	1.0	16	2.7	2	2.3	-	-	-	-	24	1.8
Kubang Pasu	1	0.2	1	0.2	-	-	-	-	-	-	2	0.2
Padang Terap	-	-	-	-	1	1.1	-	-	-	-	1	0.1
Kota Bahru	1	0.2	1	0.2	-	-	1	3.1	-	-	3	0.2
Pasir Mas	-	-	-	-	-	-	1	3.1	-	-	1	0.1
Tanah Merah	1	0.2	1	0.2	-	-	-	-	-	-	2	0.2
Alor Gajah	1	0.2	1	0.2	-	-	1	3.1	-	-	3	0.2
Jasin	-	-	2	0.3	-	-	-	-	-	-	2	0.2
Malacca Central	9	1.5	30	5.1	5	5.7	-	-	-	-	44	3.4
Jelebu	-	-	1	0.2	-	-	-	-	-	-	1	0.1
Kuala Pilah	2	0.3	2	0.3	1	1.1	-	-	-	-	5	0.4
Port Dickson	1	0.2	1	0.2	-	-	-	-	-	-	2	0.2
Seremban	14	2.4	21	3.6	2	2.3	-	-	-	-	37	2.8
Tampin	1	0.2	-	-	-	-	-	-	-	-	1	0.1
Kuantan	3	0.5	7	1.2	1	1.1	-	-	-	-	11	0.8
Pekan	-	-	3	0.5	1	1.1	1	3.1	-	-	5	0.4
Raub	-	-	1	0.2	-	-	-	-	-	-	1	0.1
Termeloh	-	-	3	0.5	-	-	-	-	1	10.0	4	0.3
Bukit Mertajam	72	12.4	47	8.0	3	3.4	5	15.6	2	20.0	129	9.9
Butterworth	17	2.9	22	3.7	1	1.1	-	-	1	10.0	41	3.2
Nibong Tebal	5	0.9	3	0.5	-	-	-	-	-	-	8	0.6
Penang N.E.	8	1.4	3	0.5	-	-	-	-	-	-	11	0.8
Penang S.W.	6	1.0	37	6.3	2	2.3	-	-	-	-	45	3.5
Batang Padang	2	0.3	3	0.5	-	-	-	-	-	-	5	0.4
Dindings	2	0.3	3	0.5	1	1.1	-	-	-	-	6	0.5
Kinta	27	4.6	34	5.8	7	8.0	3	9.4	-	-	71	5.5
Krian	7	1.2	9	1.5	1	1.1	1	3.1	-	-	18	1.4
K. Kangsar	3	0.5	2	0.3	-	-	-	-	-	-	5	0.4
Larut Matang	12	2.1	12	2.0	1	1.1	2	6.3	-	-	27	2.0
Lower Perak	1	0.2	3	0.5	2	2.3	-	-	-	-	6	0.5
Perlis	4	0.7	3	0.5	2	2.3	-	-	-	-	9	0.7
Klang	75	12.9	89	15.1	15	17.2	4	12.5	1	10.0	184	14.2
Kuala Langat	-	-	4	0.7	-	-	-	-	-	-	4	0.3
Kuala Lumpur	152	26.1	83	14.1	3	3.4	3	9.4	4	40.0	245	18.8
Kuala Selangor	2	0.3	1	0.2	-	-	-	-	-	-	3	0.2
Sabak Bernam	-	-	-	-	-	-	1	3.1	-	-	1	0.1
Ulu Langat	3	0.5	5	0.8	2	2.3	-	-	-	-	10	0.8
Ulu Selangor	4	0.7	2	0.3	4	4.6	2	6.3	-	-	12	0.9
Besut	-	-	1	0.2	-	-	-	-	-	-	1	0.1
Dungun	2	0.3	1	0.2	-	-	-	-	-	-	3	0.2
Kemaman	-	-	3	0.5	1	1.1	-	-	-	-	4	0.3
Kuala Trengganu	-	-	2	0.3	-	-	1	3.1	-	-	3	0.2
Marang	-	-	1	0.2	-	-	-	-	-	-	1	0.1
Ulu Trengganu	-	-	1	0.2	-	-	-	-	-	-	1	0.1
Total	582	-	589	-	87	-	32	-	10	-	1300	-
% of Total	44.8		45.3		6.7		2.5		0.7		100	

Fig:6.15 THE DISTRIBUTION OF APPROVED MANUFACTURING PROJECTS WITH INCENTIVES AND WITHOUT INCENTIVES FROM 1970 TO MID 1974 ACCORDING TO THE RANK OF DISTRICTS IN DESCENDING ORDER OF CONTRIBUTION TO MANUFACTURING IN 1970.



trend line of approvals with incentives descended sharply after the fifth ranking district, with the first five ranking districts being likely sites for 51.8 per cent of the approvals with incentives. Two major 'kinks' in the graph occurred in the positions representing Malacca Central and Penang south-west. Smaller 'kinks' were noticeable in positions representing Kuala Muda, Ulu Langat, Krian, Ulu Selangor and Muar. About 10.3 per cent of the approvals with incentives were expected to be located in the districts of Penang south-west and Malacca Central. Another 7.7 per cent were expected to be located in the following districts: Krian, Kuala Muda, Muar, Ulu Langat and Ulu Selangor.

However, the number of projects approved without incentives were on the increase. Table 6.14 shows that projects without incentives increased from 108 in 1970 to 171 in 1973. Furthermore, 66 per cent of these were expected to be located in the first five ranks of the districts on the 1970 manufacturing scale.

It can be deduced from the analysis above that incentives might have been significant in persuading both local and foreign industrialists to venture into industrial production in West Malaysia. Another possible deduction is that once industrialists had decided to invest in the manufacturing sector, they might have applied for incentives (which are available) to further improve their competitive position and profit margin. It is evident, however, that incentives were likely to be of secondary importance as a device for decentralising industry.

Table 6.14 NATURE OF INCENTIVES GRANTED TO PROJECTS APPROVED (1970 to Mid 1974)

Incentives	Year of Approval											
	1970		1971		1972		1973		Mid 1974		1970-Mid 74	
	No	%	No	%	No	%	No	%	No	%	No	%
Without Incentives	108	37.2	92	43.6	17	49.6	171	48.6	94	44.5	582	44.8
Pioneer Status + Export - Incentives	154	53.1	100	47.4	98	41.5	144	40.9	93	44.1	589	45.3
Investment Tax Credit	27	9.3	19	9.0	10	4.2	19	5.4	12	5.7	87	6.7
Labour utilization relief	-	-	-	-	9	3.8	13	3.7	10	4.7	32	2.5
Other Incentives	1	0.3	-	-	2	0.8	5	1.4	2	0.9	10	0.8
Total	290	99.9	211	100.0	236	99.9	352	100.0	211	99.9	1300	100.1

Source: Compiled from Data provided by F.I.D.A.

An analysis of the contribution of approved projects to different types of industry is also undertaken. Rapid increases were likely to be made to the textile industry, food manufacturing, footwear and wearing apparel industry, paper and paper products, rubber products, chemicals and chemical products, metal products and electrical machinery and components industry. Industrial breakdown of approved projects is tabulated in Table 6.15.

The largest increase in any single industry group was made in the electrical machinery, apparatus and appliance industry. The promotion of export-oriented multi-national electronic and electrical components firms in the free trade zones contributed towards this increase. The number of approved projects in this industry group increased from 24 in 1970 to 158 by mid 1974. Many of them were American, Japanese and German component manufacturing and assembly units within the vertically integrated international industries.

Judging from the industrial groupings of approvals, a shift can be predicted in the industrial structure from import - substitution of consumer non-durable industry to intermediate (284 approvals) and capital goods industry, (399 approvals) with an emphasis on exports. Advanced resource-based industry (96 projects) is likely to record a moderate growth compared with the former two groups.

The breakdown of the approved projects in the different industry groups by incentives and without incentives is given in Table 6.16. Pioneer status and

Table 6.15. INDUSTRIAL STRUCTURE OF APPROVED PROJECTS 1970 - Mid 1974

Industry Group	1970		1971		1972		1973		Mid 1974		Total	
	No	%	No	%	No	%	No	%	No	%	No	%
1. Manufacture of vegetable oils, fats, seafoods processing, canning and preserving	3	1.0	5	2.4	5	2.1	9	2.6	-	-	22	1.7
2. Food Manufacturing	36	12.4	26	12.3	23	9.7	28	8.0	16	7.6	129	9.9
3. Beverages	2	0.7	1	0.5	2	0.8	-	-	2	0.9	7	0.5
4. Tobacco Products	3	1.0	2	0.9	1	0.4	1	0.3	-	-	7	0.5
5. Textiles	15	5.2	17	8.1	15	6.4	57	16.2	5	2.4	109	8.4
6. Footwear, wearing apparel & made-up textile goods	17	5.9	9	4.3	15	6.4	19	5.4	29	13.8	89	6.8
7. Wood, Rattan Attap & Cork Products	27	9.3	13	6.2	7	3.0	13	3.7	4	1.9	64	4.9
8. Manufacture of furniture and fixtures	2	0.7	1	0.5	-	-	4	1.1	6	2.9	13	1.0
9. Manufacture of paper & paper products	3	1.0	3	1.4	15	6.4	9	2.6	3	1.4	33	2.5
10. Printing, Publishing & allied industry	1	0.3	2	0.9	-	-	1	0.3	-	-	4	0.3
11. Leather and Leather Products	-	-	-	-	1	0.4	2	0.6	-	-	3	0.2
12. Rubber Products	5	1.7	10	4.7	9	3.8	13	3.7	4	1.9	41	3.2
13. Chemical and Chemical products	28	9.7	19	9.0	21	8.9	36	10.3	32	15.2	136	10.5
14. Petroleum & Coal Products	1	0.3	4	1.9	-	-	-	-	-	-	5	0.4
15. Non-metallic and mineral products	24	8.3	12	5.7	9	3.8	33	9.4	24	1.8	102	7.8
16. Basic Metal Industry	7	2.4	12	5.7	4	1.7	10	2.8	4	1.9	37	2.9
17. Manufacture of Metal Products	39	13.4	12	5.7	17	7.2	20	5.7	28	13.3	116	8.9
18. Machinery Manufacturing	4	1.4	12	5.7	17	7.2	10	2.8	2	1.0	45	3.5
19. Electrical Machinery Apparatus & Appliances	24	8.3	14	6.6	39	16.5	43	12.3	38	18.1	158	12.2
20. Transport Equipment	8	2.8	9	4.3	5	2.1	13	3.7	8	3.8	43	3.3
21. Miscellaneous	42	14.5	28	13.3	31	13.1	31	8.8	5	2.4	137	10.5
Total	290		211		236		352		211		1300	

Table 6.16. NATURE OF INCENTIVES FOR APPROVED PROJECTS OF DIFFERENT INDUSTRY GROUPS, 1970 to mid 1974

Industry Group	Without Incentives		Pioneer Status & Incentives for Export-Oriented Industry		Investment Tax Credit		Labour Utilization Relief		Other Incentives		Total
	No.	%	No.	%	No.	%	No.	%	No	%	
1. Manufacturing of vegetables, oils, fats, sea foods, processing, canning and preserving	10	1.7	6	1.0	5	5.7	-	-	1	10.0	22
2. Food Manufacturing	70	12.0	31	5.3	18	20.7	9	28.1	1	10.0	129
3. Beverages	3	0.5	3	0.5	-	-	1	3.1	-	-	7
4. Tobacco Products	2	0.3	3	0.5	2	2.3	-	-	-	-	7
5. Textiles	43	7.4	59	10.0	-	-	6	18.8	1	10.0	109
6. Footwear, wearing apparel & made-up textile goods	55	9.5	20	3.4	8	9.2	5	15.6	1	10.0	89
7. Wood, Rattan, Attap & cork products	17	2.9	42	7.1	3	3.4	1	3.1	1	10.0	64
8. Manufacture of Furniture and Fixtures	5	0.9	8	1.4	-	-	-	-	-	-	13
9. Manufacture of Paper & Paper Products	26	4.5	5	0.8	2	2.3	-	-	-	-	33
10. Printing, Publishing & allied industry	4	0.7	-	-	-	-	-	-	-	-	4
11. Leather & Leather Products	1	0.2	1	0.2	-	-	-	-	1	10.0	3
12. Rubber Products	13	2.2	25	4.2	2	2.3	-	-	1	10.0	41
13. Chemical and Chemical Products	76	13.1	50	8.5	9	10.3	1	3.1	-	-	136
14. Petroleum and Coal Products	4	0.7	1	0.2	-	-	-	-	-	-	5
15. Non-metallic mineral products	56	9.6	30	5.1	13	14.9	2	6.3	1	10.0	102
16. Basic Metal Industry	17	2.9	20	3.4	-	-	-	-	-	-	37
17. Manufacture of Metal Products	68	11.7	41	7.0	6	6.9	1	3.1	-	-	116
18. Machinery, Manufacturing	19	3.3	19	3.2	6	6.9	1	3.1	-	-	
19. Electrical Machinery Apparatus, Appliances	31	5.3	123	20.9	3	3.4	1	3.1	-	-	158
20. Transport Equipment	12	2.1	26	4.4	5	5.7	-	-	-	-	43
21. Miscellaneous	50	8.6	76	12.9	5	5.7	4	12.5	2	20.0	137
Total	582	100.0	589	100.0	87	100.0	32	100.0	10	100.0	1300
Percentage of Total		44.8		45.3		6.7		2.5		0.8	100.1%

export incentives were granted to 78 per cent of the approved projects in the electrical industry, 66 per cent of the projects in the wood and wood products industry and 54 per cent of the projects in the textile industry. A third of the approved projects in chemical and metal products industries were also granted these incentives. Incentives for Labour Utilization relief were concentrated among food, textile and clothing industries. Investment tax credit was spread out among a large number of industry groups.

It is difficult to deduce from this association between incentives and project approvals in different industries, the precise role of incentives in the decision to invest in West Malaysia.

On the question of employment, information was not available on twenty-one projects. Based on the information available on the rest of the approved projects it is clear that the most significant contribution to employment-estimates was made by the electrical machinery, appliance and apparatus industry. Its share was expected to amount to 22 per cent of the job estimates of 251,519 (based on the projects approved over the entire period 1970 to mid 1974). This reflects the propensity of multi-national electronic firms to create low wage employment for unskilled and semi-skilled labour. The second largest contribution to employment estimates (15 per cent) was made by the textile industry while food manufactures were expected to create another 12 per cent of the jobs (Table 6.17).

Table 6.17. CONTRIBUTION OF APPROVED PROJECTS BY DIFFERENT INDUSTRY GROUPS TO ESTIMATED EMPLOYMENT (1970 - Mid 1974)

Industry Group	No. of Approved Projects	No. of Projects for which data on employment is available	Employment Estimates	% of Total Employment Estimates
1. Manufacturing of vegetables, oils, fats, sea foods, processing, canning and preserving	22	22	4,822	1.92
2. Food Manufacturing	129	127	30,326	12.06
3. Beverages	7	6	646	0.26
4. Tobacco Products	7	7	678	0.27
5. Textiles	109	108	37,184	14.87
6. Footwear, wearing apparel & made-up textile goods	89	88	17,636	7.01
7. Wood, rattan, attap, cork products	64	64	12,870	5.12
8. Manufacture of furniture & fixtures	13	12	4,512	1.79
9. Manufacture of paper & paper products	33	33	2,607	1.04
10. Printing, publishing & allied industry	4	4	252	0.10
11. Leather & leather products	3	3	664	0.26
12. Rubber products	41	40	8,234	3.27
13. Chemical & chemical products	136	133	17,526	6.97
14. Petroleum & coal products	5	3	296	0.10
15. Non-metallic and mineral products	102	100	8,673	3.45
16. Bsica metal industry	37	36	3,537	1.41
17. Manufacture of metal products	116	114	12,162	4.84
18. Machinery manufacturing	45	44	4,501	1.79
19. Electrical machinery, apparatus and appliances	158	155	54,499	21.67
20. Transport equipment	43	43	6,241	2.48
21. Miscellaneous	137	137	23,653	9.40
Total	1300	1279	251,519	100.10

An analysis of variance gives an F value of 3.1336.

During the period, estimated employment appeared to be rising. Industries approved in 1970 were expected to create 43,000 jobs. Despite a slight fall in the numbers estimated for 1971, industries approved in 1972 were expected to create 49,500 jobs which amounted to 19 per cent of the total employment estimates. Projects approved in 1973 were expected to create 78,700 jobs (31 per cent of the total employment estimates). Projects approved in the first half of 1974 were expected to create another 42,800 jobs (17 per cent of the total estimates), Table 6.18. This steady increase reflects not only on the increase in the number of projects approved in each year but also on the change to the type of industry that can employ more labour.

An analysis of the contribution to employment estimates by projects with incentives and by those without incentives is shown in Table 6.19. Seventy-seven per cent of the estimated employment was created by projects with incentives. This is a very high figure considering that only 55 per cent of the approved projects were with incentives and 45 per cent of them were without incentives. Among the projects with incentives, approvals with pioneer status and export-incentives were likely to generate 64 per cent of the jobs estimated (they amounted to 45 per cent of the projects approved).

Spatial distribution of estimated employment of all projects approved (1970 to mid 1974) is summarised in Table 6.20. As a significant percentage of the estimated employment was likely to be generated by multi-national

Table 6.18 CONTRIBUTION TO ESTIMATED EMPLOYMENT BY PROJECTS APPROVED BETWEEN 1970 AND MID 1974

Year	No of Projects Approved	No. of Approved Projects For Which Data on Employment Is Available	Employment Estimates	% of Total Employment Estimates
1970	290	278	43,377	17.25
1971	211	208	36,971	14.70
1972	236	233	49,563	19.71
1973	352	351	78,756	31.30
January to June 1974	211	209	42,852	17.04
	1300	1279	251,519	100.00

Table 6.19 CONTRIBUTION TO ESTIMATED EMPLOYMENT BY PROJECTS APPROVED WITH INCENTIVES AND WITHOUT INCENTIVES, 1970 to mid 1974

Nature of Incentives	No of Approved Projects	No. of Projects for which data on employment is available	Employment Estimates	% of Total Employment Estimates
Without Incentives	582	570	47,144	18.74
Pioneer status and incentives for export industry	589	585	161,918	64.38
Investment Tax Credit	87	86	30,574	12.16
Labour Utilization Relief	32	32	8,027	3.19
Other Incentives	10	6	3,856	1.53
Total	1300	1279	25,519	100.00

Table 6.20. DISTRIBUTION OF ESTIMATED EMPLOYMENT LIKELY TO BE CREATED BY INDUSTRIAL PROJECTS APPROVED IN 1970 TO MID 1974

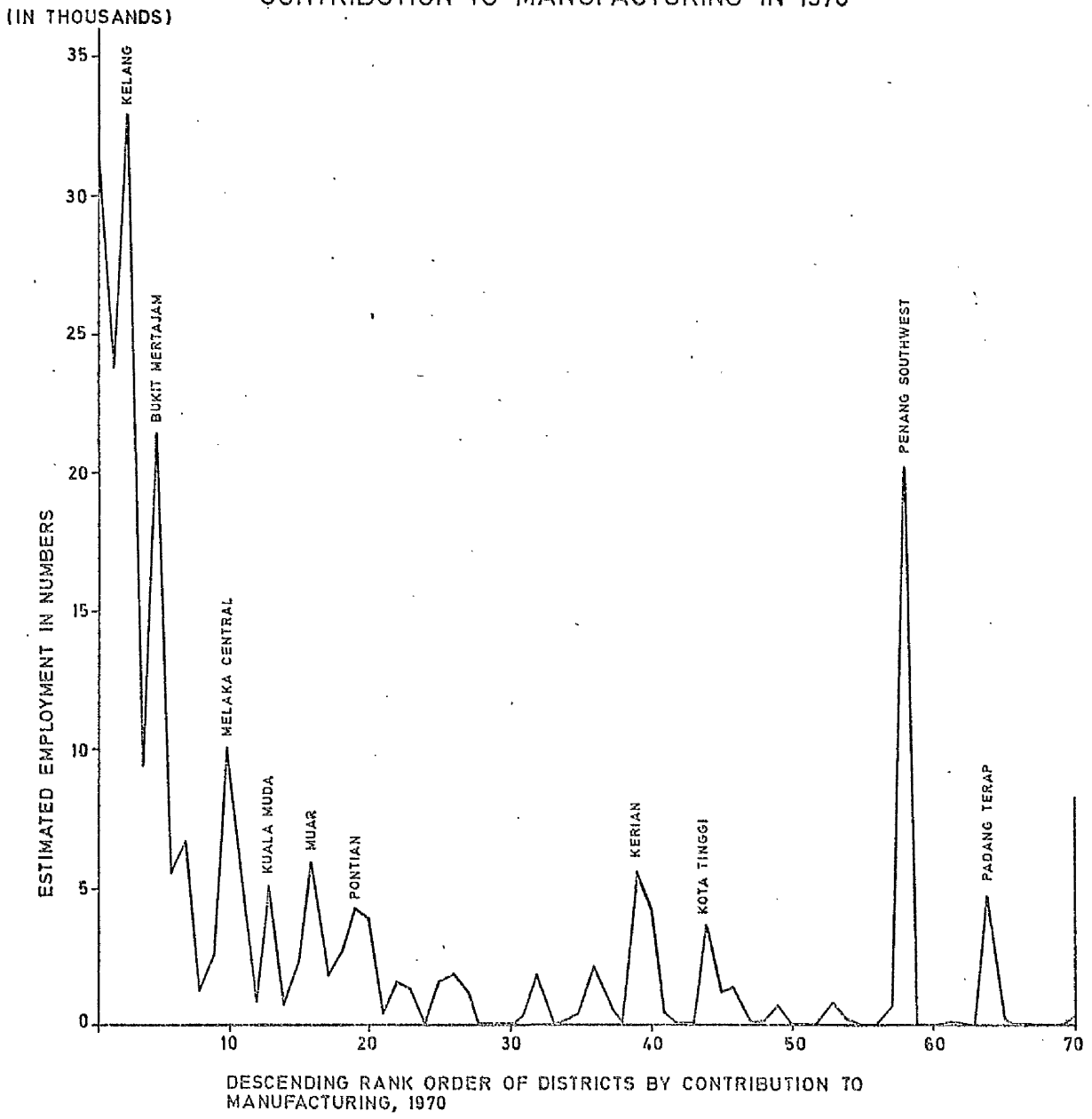
DISTRICT	No. of Projects Approved 1970-mid 74	No. of Projects for which data on employment is available	Estimated Employment	% of Total Estimated Employment
Not specified	99	94	17,245	6.86
Batu Pahat	21	21	2,387	0.95
Johore Bahru	128	125	23,799	9.46
Kluang	6	6	1,064	0.42
Kota Tinggi	4	4	3,802	1.51
Mersing	2	2	26	0.01
Muar	13	13	5,848	2.33
Pontian	11	11	4,127	1.64
Segamat	1	1	15	0.01
Baling	1	1	88	0.03
Kota Star	12	12	1,583	0.63
Kuala Muda	24	24	4,728	1.88
Kubang Pasu	2	2	58	0.02
Padang Terap	1	1	4,830	1.92
Kota Bahru	3	3	555	0.22
Pasir Mas	1	1	78	0.03
Tanah Merah	2	2	776	0.31
Alor Gajah	3	3	755	0.30
Jasin	2	2	922	0.37
Malacca Central	44	44	10,134	4.03
Jelebu	1	1	407	0.16
Kuala Pilah	5	5	981	0.39
Port Dickson	2	2	398	0.16
Seremban	37	35	6,458	2.67
Tampin	1	1	26	0.01
Kuantan	11	10	2,580	1.03
Pekan	5	5	592	0.24
Raub	1	1	73	0.03
Temeloh	4	4	1,913	0.76
Bukit Mertajam	129	128	21,359	8.49
Butterworth	41	39	5,326	2.12
Nebong Tebal	8	8	1,427	0.57
Penang North East	11	11	2,026	0.81
Penang South West	45	45	20,236	8.05
Batang Padang	5	5	319	0.13
Dindings	6	6	3,709	1.47
Kinta	71	69	9,214	3.66
Krian	18	18	5,575	2.22
Kuala Kangsar	5	5	1,352	0.54
Larut / Matang	27	26	5,374	2.14
Lower Perak	6	6	1,592	0.63
Perlis	9	9	4,229	1.68
Klang	184	184	32,720	13.01
Kuala Langat	4	4	2,260	0.90
Kuala Lumpur	245	241	31,019	12.33
Kuala Selangor	3	3	373	0.15
Sabak Bernam	1	1	79	0.03
Ulu Langat	10	10	1,551	0.62
Ulu Selangor	12	12	1,774	0.71
Besut	1	1	65	0.01
Dungun	3	3	1,236	0.49
Kenaman	4	4	888	0.35
Kuala Trengganu	3	3	1,283	0.51
Marang	1	1	256	0.10
Ulu Trengganu	1	1	71	0.03
Total	1300	1279	251,519	100.00

firms, the localization of these firms in free trade zones is likely to lead to the concentration of manufacturing employment in districts with these free trade zones. In addition, industrial estates that have successfully drawn approved export-oriented or labour-intensive industry such as textile industry and clothing industry will also reflect similar patterns.

The distribution of employment estimates of all approved projects is charted against the rank order of districts by their level of manufacturing in 1970, in Figure 6.16. The graph shows that the Klang Valley was likely to have the largest number of jobs on the basis of the projects approved. It was recorded to have 13 per cent of the employment estimates. Johore Bahru district would have the second largest number of jobs estimated, followed by Bukit Mertajam and Penang South-west. In Bukit Mertajam, approved projects attracted to the two industrial estates and two free trade zones were the main contributors to employment estimates while in Penang south-west the approved multi-national electronic factories for the Bayan Lepas free trade zone were likely to create eight per cent of the jobs estimated. If all approved projects are implemented, the regional importance of Penang State in decentralising employment in the manufacturing sector will be greatly enhanced.

Significant changes will be noticeable in Malacca Central which is likely to create 10,000 new jobs based on the projects approved during the whole period. Projects approved for Krian, Kuala Muda, Muar, Padang Terap,

Fig:6.16 DISTRIBUTION OF ESTIMATED EMPLOYMENT OF MANUFACTURING PROJECTS GRANTED APPROVAL BETWEEN 1970 AND MID 1974 ACCORDING TO RANK ORDER OF DISTRICTS BY THEIR CONTRIBUTION TO MANUFACTURING IN 1970



Seremban and Larut/Matang are also like to create in the region of 5,000 jobs in the manufacturing sector in each of these districts.

In the east coast noticeable contribution to industrial employment will be achieved in Kuantan, Termeloh and Kuala Trengganu. Approved projects in these districts are likely to create between 1200 to 2000 jobs in each district.

This pattern indicates that in terms of employment the dispersion likely to be achieved (based on employment estimates of approved projects) will be greater than in terms of project approvals.

A comparison of Table 6.10 and Table 6.20 confirms that in nineteen districts the contribution to estimated employment was higher than the districts' share of projects approved. This also reflected the preference of labour-intensive industry for locations in Penang south-west, Muar, Kota Tinggi, Padang Terap, Malacca Central, Kuantan, Termeloh and Krian. These districts were at the periphery of the main industrial concentrations.

In the high ranking districts on the manufacturing scale of 1970, the contribution to estimated employment was lower than their share of approved projects suggesting a preference for a higher capital to labour ratio in production. As data on capital is not available due to the code of confidentiality, this statement cannot be verified.

Information on a segment of industry is available in the form of data on all companies awarded Pioneer status till December 1973. As Pioneer status

together with export-incentives accounted for 45.3 per cent of the approved projects, this data could be used as a representative sample of the manufacturing sector in the post-1969 period.

6.4 Pioneer Industry

By the year 1973, 234 manufacturing companies were awarded Pioneer Certificates. The employment and capital structure of these units is given by industry groups in Table 6.21.

The industrial structure was a synthesis of the impact of the initial and the post 1969 industrial development. The major industrial components were chemical and chemical products industry, wood-based industry, textile and textile products industry and electrical machinery and component industry. The largest contribution to manufacturing employment was made by the textile and textile goods industry and by the electrical component industry. Jointly, they contributed 37.4 per cent of the new jobs. This appears to be in line with the approvals analysed earlier on.

The total capital invested by Pioneer Companies amounted to $998 million but the number of jobs created amounted to 64,450, that is, one jot for every $15,487 worth of capital invested. The capital-labour ratio, however, was higher than the overall average in nine industry groups as shown in Table 6.21 and marked with an asterisk. The highest capital-labour ratio, as expected,

Table 6.21. WEST MALAYSIA: EMPLOYMENT AND CAPITAL STRUCTURE OF COMPANIES AWARD PIONEER CERTIFICATES BY INDUSTRY GROUPS AS AT DECEMBER 1973

Industry Group	No. of Estbs.	Employ -ment	CAPITAL ($) Local	Foreign	Total	Capital-Labour Ratio $ Capital per unit of Labour
1. Vegetable oils seafood processing, canning, preserving & animal feeds	9	1,676	15,571,954 73.6%	5,572,825 26.4%	21,144,779	12,616.2
2. Sugar Refining	5	1,125	19,984,200 51.2%	19,071,800 48.8%	39,056,000	34,716.0*
3. Food	17	2,431	33,737,790 44.5%	42,001,400 55.5%	75,739,190	31,156.0*
4. Beverages	2	611	2,533,050 10.6%	21,466,950 89.4%	24,000,000	39,280.0*
5. Animal Slaughter	1	49	2,416,667 87.9%	333,333 12.1%	2,750,000	56,122.0*
6. Textiles & textile products	24	14,099	91,709,857 61.4%	57,608,822 38.6%	149,318,679	10,591.0
7. Leather & leather products	1	88	365,765 27.5%	964,000 72.6%	1,329,765	1,511.1
8. Wood & wood products	27	9,813	98,487, 0 50 84. 9%	I7,569, 352 I5. I%	II6, 056, 402	II, 827. o
9a. Paper & paper products	1	188	2,000,000 100.0	-	2,000,000	10,638.0
9b. Printing & publishing	2	582	2,882,500 72.2%	1,110,000 27.8%	3,992,500	6,860.0
10. Chemical & chemical products	38	4,353	50,804,270 48.0%	55,125,346 52.0%	105,926,616	24,335.0*
11. Petroleum & petroleum products	5	515	18,230,328 19.7%	74,581,096 80.3%	92,811,424	180,216.0*
12. Rubber products	5	1,692	16,563,966 45.0%	20,280,646 55.0%	36,844,612	21,776.0*
13. Plastic products	11	4,336	30,842,925 86.4%	4,857,249 13.6%	35,700,174	8,233.0
14. Non-metallic products	15	3,729	29,138,430 55.6%	23,245,230 44.4%	52,383,660	14,048.0
15. Basic Metal Industries	9	3,750	43,069,530 38.3%	69,433,291 61.7%	112,502,821	30,001.0*
16. Fabricated Metal Products	24	3,578	23,968,975 55.6%	19,144,437 44.4%	43,113,412	12,050.0
17. Machinery	4	360	2,122,121 43.9%	2,708,990 56.1%	4,831,111	13,420.0
18. Electrical Machines & Components	23	10,023	26,171,493 46.7%	29,863,721 53.3%	56,035,214	5,591.0
19. Transport Equipment	3	313	1,280,503 27.4%	3,399,500 72.6%	4,680,003	14,952.0
20. Scientific & Measuring Equipment	3	678	5,057,832 61.7%	3,137,008 38.3%	8,194,840	12,087.0
21. Miscellaneous	5	467	6,805,980 69.3%	3,011,004 30.7%	9,816,984	21,021.0*
Total	234	64,456	523,745,186 52.5%	474,486,000 47.5%	998,231,186	15,487.0

Note: * Industry with Capital-Labour Ratio higher than the overall average.

Dollars refers to Malaysian dollars.

Source: Compiled from data obtained from FIDA.

was in the petroleum industry. A capital-labour ratio of $180,216 per job was recorded.

In 1968 the capital-labour ratio among pioneer companies was $19,823 to one.[1] An overall ratio of $15,487 to one in 1973 shows that the ratio has fallen. This could be due to the promotion of labour-intensive industries (Electrical components recorded a capital-labour ratio of $5,591 to one - the lowest among industry groups).

Spatially the distribution of capital-labour ratio varied tremendously from $201,754:1 in Port Dickson district to $1205:1 in Kota Bahru. Thirteen districts among the twenty-nine districts in which Pioneer establishments operated had higher capital-labour ratios than the overall average. (Table 6.22)

With regards equity participation a move in favour of Malaysian ownership was evident. Table 6.21 outlines employment and Capital Structure of Pioneer Companies. The Malaysian share was 52.5 per cent of the total capital invested while 47.3 per cent was foreign-owned. However, the ratio varied among the industry groups. In export-oriented industry and industry serving a national market, foreigners held a major share from as high a proportion as 89 per cent in Beverages, 80 per cent in petroleum, 73 per cent in leather products and transport equipment

---

1. In 1968 Pioneer Companies employed 22,652 full-time paid workers and recorded total fixed assets of $449 million. West Malaysia, Census of Manufacturing, Op.cit., P. 228, 230.

Table 6.22. EMPLOYMENT, INDUSTRY GROUPING AND CAPITAL STRUCTURE OF COMPANIES AWARDED PIONEER CERTIFICATES CLASSIFIED BY DISTRICTS AS AT 31.12.1973.

Districts	No. of Estbs.	Employment		Advanced Resource-Based		Consumer Non-Durable		Intermediate		Capital Goods		CAPITAL					Capital-Labour Ratio Amount of Capital ($) per employee
												Local		Foreign		Total	
		No.	%	No.	%	No	%	No	%	No	%	$	%	$	%		
Johore Bahru	27	6,325	9.8	4	7.8	6	15.0	9	12.5	8	11.3	36,567,206	7.0	30,489,333	6.4	67,056,539	10,602
Pontian	1	45	0.07	1	2.0	-	-	-	-	-	-	750,000	0.1	2,250,000	0.5	3,000,000	69,767*
Segamat	1	198	0.3	1	2.0	-	-	-	-	-	-	4,503,180	0.9	48,960	0.0	4,552,140	22,991*
Kluang	4	2,431	3.8	2	3.9	1	2.5	1	1.4	-	-	12,248,705	2.3	10,999,070	2.3	23,247,775	9,563
Batu Pahat	3	1,447	2.2	-	-	2	5.0	-	-	1	1.4	8,799,642	1.7	2,944,644	0.6	11,744,286	8,116
Kota Star	1	36	0.1	1	2.0	-	-	-	-	-	-	300,000	0.1	10,000	0.0	310,000	8,611
K. Muda	3	653	1.0	3	5.9	-	-	-	-	-	-	3,526,000	0.7	-	-	3,526,000	5,400
K. Bahru	1	415	0.6	-	-	1	2.5	-	-	-	-	500,000	0.1	-	-	500,000	1,205
Ulu Kelantan	1	461	0.7	-	-	1	2.5	-	-	-	-	11,080,000	2.1	-	-	11,080,000	24,035*
Mal. Central	3	1,099	1.7	2	3.9	-	-	-	-	1	1.4	11,164,936	2.1	7,374,000	1.6	18,538,936	16,869*
Seremban	2	835	1.3	1	2.0	-	-	1	1.4	-	-	8,537,883	1.6	10,597,729	2.2	19,135,612	22,917*
Port Dickson	2	456	0.7	-	-	-	-	2	2.8	-	-	17,418,904	3.3	74,581,096	15.7	92,000,000	201,754*
Kuantan	2	715	1.1	1	2.0	-	-	-	-	1	1.4	2,750,000	0.5	-	-	2,750,000	3,846
Pekan	1	457	0.7	1	2.0	-	-	-	-	-	-	11,526,405	2.2	3,285,001	0.7	14,811,406	32,410*
Jerantut	1	70	0.1	1	2.0	-	-	-	-	-	-	1,623,106	0.3	-	-	1,623,106	23,187*
Raub	1	378	0.6	1	2.0	-	-	-	-	-	-	3,553,267	0.7	-	-	3,553,267	9,400
Termeloh	1	563	0.9	1	2.0	-	-	-	-	-	-	10,977,726	2.1	3,468,216	0.7	14,445,942	25,659*
Dindings	3	886	1.4	2	5.9	-	-	1	1.4	-	-	9,467,600	1.8	7,853,800	1.7	17,321,400	19,550*
Kinta	17	3,200	5.0	6	11.8	-	-	5	6.9	6	8.5	36,015,573	6.9	11,997,369	2.5	48,012,942	15,004*
Larut/Matang	10	8,164	12.7	2	3.9	3	7.5	3	4.2	2	2.8	58,876,548	11.2	14,037,600	3.0	72,914,148	8,931
B. Padang	1	158	0.2	-	-	-	-	1	1.4	-	-	1,010,535	0,2	895,965	0.2	1,906,500	12,066
Penang N.E.	1	447	0.7	1	2.0	-	-	-	-	-	-	755,000	0.1	245,000	0.1	1,000,000	2,237
Penang S.W.	5	4,544	7.0	-	-	1	2.5	-	-	4	5.6	4,322,345	0.8	3,869,364	0.8	8,191,709	1,803
B. Mertajam	14	4,520	7.0	3	5.9	4	10.0	4	5.6	3	4.2	65,109,045	12.4	70,507,201	14.9	72,159,765	15,965*
Butterworth	10	3,334	5.2	2	3.9	4	10.0	2	2.8	2	2.8	28,817,054	5.4	18,437,938	3.9	47,254,992	14,174
Klang	33	5,355	8.3	5	9.8	1	2.5	15	20.8	12	16.9	79,401,837	15.2	58,457,010	12.3	137,858,847	25,744*
K. Lumpur	83	16,412	25.5	9	17.6	15	37.5	28	38.9	31	43.7	89,767,689	17.1	132,845,975	28.0	222,613,664	13,564
Ulu Langat	1	789	1.2	-	-	1	2.5	-	-	-	-	4,000,000	0.8	9,290,729	2.0	13,290,729	16,845*
K. Selangor	1	65	0.1	1	2.0	-	-	-	-	-	-	375,000	0.1	-	-	375,000	5,769
Total	234	64,456	99.9	51	100.0	40	100.0	72	100.0	71	100.0	523,745,186	99.9	474,486,000	100.1	998,231,186	15,487
% of total	100%											52.5%		47.5%		100.0%	

* Capital-Labour Ratio higher than the overall mean.

Source compiled from data provided by FIDA.

to slightly more than half in rubber products, machinery, fabricated metal and basic metal industries.

Capital Investment includes both called-up-capital and loan capital. If the loan capital is omitted and only call-up-capital is considered, then the Malaysian share amounted to 49.1 per cent and the foreign called-up-capital amounted to 50.9 per cent.

In the Malaysian component of the called-up-capital, Bumiputras held 15 per cent, the Chinese 49.8 per cent, Indians 2.06 per cent and Others 33.4 per cent. The Bumiputra share has increased[1] rapidly indicating a trend in line with the objectives specified in the new economic policy.

6.5 An Appraisal of Growth and Structure

Before evaluating the performance of the manufacturing sector in the post 1969 period the data source on which the analysis rest has to be clarified. In the absence of data after 1970 and in the attempt to deduce the trends in the growth and structure of the manufacturing sector, data on approved applications of industrial projects have been resorted to. These data have been supported by data on companies granted Pioneer Certificates up to 1973.

---

1. Malay ownership of corporate and non-corporate sectors of industry was 0.9 per cent and 2.3 per cent respectively in 1970. Malaysia, Mid Term Review of the Second Malaysia Plan, Op. cit., p. 12.

Approvals are liable to a certain degree of uncertainty. There is usually a time lag between approvals and the actual operation of the project. The length of the time interval in turn is determined by a considerable number of factors within and outside the jurisdiction of the country. A favourable business climate in the world has a considerable impact on foreign investors' and even local investors' readiness to invest, especially in a country like Malaysia where foreign trade is the "pulse" of the economy. A downward trend in business during a recession as has been faced since 1973 certainly turns investment away from new ventures and postponement of investment is likely.

Furthermore, changes in the political and economic climate within the country of operation or country supplying the foreign capital could jeopardise plans and give cause for rethinking before a project is launched. In shoft, any or all these factors could cause slippages between plans and actual implementation. These factors have to be kept in mind when analyses are based on projected possibilities rather than industry in operation.

The trend of industrial growth in the post-1969 period has been favourable despite the short time span following the introduction of the objectives of the new industrial policy. It certainly appears to be heading in the direction of possibly solving some of the problems encountered in the late 1960's. However, the pattern has revealed some features which warrant new lines of approach if the expectations are to be fully realised.

A change in the industrial structure from import-substitution to export-oriented industry appears to have been successfully initiated with the promotion of multi-national components and assembly plants in the free trade zones, and the rapid increase in textile industry, clothing industry, wood-based industry and chemical and rubber products industries.

Industry which possess higher local content is less forthcoming while the increase in wood-based industry slowed over the period due to the fall in world prices for these commodities.

In terms of employment, projects approved between 1970 and mid 1974 are estimated to create approximately 251,519 new jobs (information was not available for 21 projects). The contribution to employment estimates are made mainly by labour-intensive industries such as textile, clothing and electronic industries.

The capital-labour ratio is high although there are signs in Pioneer Industry of a slight decline from the 1968 mean capital-labour ratio. If the textile and electronic projects are excluded the capital-labour ratio is on the increase. This is also borne out by the lower number of projects qualifying for labour Utilization Relief.

During this period, there was a slight shift in equity participation in favour of Malaysians but foreign interests still dominate the scene. In the more important groups of industry majority foreign-ownership was evident. Bumiputra participation as a segment of the Malaysian component has increased to 15 per cent among companies

holding Pioneer Certificates. The limited financial capacity of Bumiputras is indicated by the fact that not all shares held by the Bumiputra Participation Unit of the Ministry of Trade have been taken up.

The success of public enterprise as an instrument for achieving some of the targets of the new economic policy is evident in the impact of public corporations in achieving a higher share of Bumiputra participation in corporate ownership and in employment, particularly, in the higher level occupational categories.[1] The promotion, through joint ventures, of agro-based and other industries by the State Development Corporations is indicative of their involvement. The strictly manufacturing activities of the State Development Corporations are summarised in Appendix Table A 6.3. Despite their achievement, the creation of a Ministry for Co-ordination of Public Corporations is indicative of the lack of co-ordination among public corporations.

The spatial distribution of projects by industry groups and the localization of export-oriented industry, in import-export enclaves called free trade zones raises doubts on the ability of this industry to generate backward and forward linkages with existing and new industry. The multiplier effect of this industry is also questionable.

Apart from the employment creating ability of export-oriented multi-national firms the benefits likely to

---

1. Mid-Term Review of the Second Malaysia Plan, Op.cit., p. 14-16.

be generated to regional economies appear to be few. Although it is too early on the basis of available data to evaluate the full impact of these establishments yet personal observations of the progress of free trade zones testify to the uncertainties expressed.

The short period under study in this thesis does not allow dogmatic conclusions but the trend of events so far and the experiences in other countries where multi-national companies operate verify that the same trends may exist in West Malaysia unless policies are modified.

As a majority of the multi-national component and assembly plants are operating on incentives and others (based on the information of approvals) are likely to do so, the Government revenue from these industries is not a principal contribution. In this respect, they differ from resource-based export industry which contributes significantly towards Government Revenue.

Furthermore, majority ownership in these industries is foreign, so that even for those multi-national industries not operating on incentives, the profit component of value added remains amenable to manipulation as indicated by Helleiner.[1] Both inputs and outputs are imported and exported. The components manufactured may generate an output for which there is no outlet other than the parent firm or subcontractors. The transfer prices for both inputs and outputs will in such cases reflect

---

1. Helleiner, G.K. 'Export Earnings within the multi-national company framework'. Far East Trade and Development, August 1972, P. 295 and 296.

the parent firms assessments as to the most desirable locations in which to declare their world-wide profits. There is no means of checking the suitability of the price quoted, locally.[1] Furthermore, the cost of capital and other inputs could exceed the measured value added.

The bulk of the earnings accruing to the country of operation is in the form of wages paid to unskilled or semi-skilled labour. As these plants are usually located in areas of excess capacity of labour (confirmed by the industrial survey in the previous chapter), the wages paid to labour are determined by the "buyers" market and not by the "sellers" market. Hence the percentage of the wage bill paid to unskilled and semiskilled labour is a small fraction of the total salaries and wages of the industry. Skilled labour is usually foreign in the early stages of the industry thus further eroding the contributions.

The multiplier effect of employment in the above situation is likely to be low since multiplier effect only arises from expanded incomes of industrial workforce.

In multi-national component assembly backward and forward linkages are precluded. The only exception is the small demand for packaging materials and such services and the increase in construction activity for the construction of factory buildings.

Component assembly does not appear to lead to component fabrication largely because industry is located with the aim of utilizing and capitalising on spare

---

1. Helleiner, G.K., Op.cit., P. 295.

capacity of unskilled labour to reduce the costs of assembling the imported components. As these incomes are a mere trickle down the pipelines, dominated as they are by a "buyers market" the multiplier effect cannot be expected to be high.

The contribution to employment made by these industries is not free of cyclical instability. Fluctuations in world demand and trade conditions in exporting countries are likely to be felt as pressures from the parent company to cut back production and employment. The implications of such instabilities were felt in the form of retrenched labour during the recession in 1974 and 1975.

The multinational corporations, undoubtedly provide the possibilities of combining the profit-motives of the private entrepreneurs with the solution to the West Malaysian development problem of creating employment for the unskilled labour. The rationality of the decision-making of the multi-nationalists have to be approached with caution so as to avoid the drawbacks and the criticism that have been made of foreign investment in the agricultural raw materials and activities of foreign investors in the first phase of industrialization.

Helleiner has stated that incentives offered to foreign investors particularly multinational firms are of marginal importance to their investment decisions. The international firm's decision about locating its plants throughout the world are likely to be based primarily upon more fundamental factors.[1] These factors include the

---

1. Helleiner, G.K., Op.cit., P. 297.

availability of spare capacity of unskilled labour and the ability to overcome problems and restrictions at home, such as quotas and tariff barriers. The same conclusions were indicated in the industrial survey of motives for investing in West Malaysia.

The question arises as to whether the provision of free trade zones within which various tax concessions apply would not suffice as locational incentives.

Dispersion of approved industrial projects to areas outside the existing zones or centres of concentration have to be judged on two scales. The first scale measures dispersion as a movement of new industrial projects to areas outside the centres of industrial polarization be they intra-district or inter-district. The second considers locational deviation from the core areas in the light of their impact on designated Development Areas to which industry is enticed by locational incentives. The latter movement is also important as it is the real measure of the success of the policy of reducing regional inequalities.

Analysis has shown that a large segment of approvals have selected districts that constitute the relatively "dynamic economic core"[1] as a response to the pull of a relatively attractive environment for industry. This is a response to available sites in new urban centres,

---

1. Keeble, D.E., 'Regional Policies after Davies', Area, Institute of British Geographers, 1972, Vol. 4, No. 2, P. 136.

industrial estates and free trade zones planned within these districts, but located at the outskirts and just short distances away from existing urban-industrial centres such as Kuala Lumpur and Shah Alam.

Outside the districts that constitute the "dynamic economic core" locational preference for districts adjacent to or short distances away from them is evident.

The tendency for newly approved industry to favour locations in the urban-rural fringe areas of existing industrial-urban centres brings to mind the pattern of industrial decentralization prevalent in developed countries.[1] The latter is a case of the movement of existing industry from core areas of major metropolitan centres to the non-core locations or to new centres. It denotes a centrifugal pattern of industrial development.

Industrial decentralization in the West Malaysian context takes a different form. It is rarely a question of movement of existing or established manufacturing units. It is specifically related to new entrants into the manufacturing sector. The centrifugal process discussed in this chapter is more apparent than real. It is in essence a centripetal process. New manufacturing units are approved to be located either in the districts which already possess large urban-industrial centres (aided in most cases by the

---

1. Moses L. and Williamson, H.W. 'Location of Economic Activities in Cities', The American Economic Review LVII, 1967, P. 211-22, and Keeble, D.E., 'Industrial Migration from North-West London 1940 to 1964', in Regional Analysis and Development. Open University Set Book, 1973, p. 206-219.

creation of new industrial sites) or in new urban centres in the fringe areas or hinterlands but within the spheres of influence of the large centres. The sphere of influence of the urban centre may extend beyond the administrative boundary into the adjacent districts. Thus, what have been termed "dispersion" effects in Penang South-west, Bukit, Mertajam, Butterworth, Krian and Kuala Muda are in essence a centripetal force converting the weak and isolated industrial core into an industrial region in the north-west.

Similarly movement of industry into Larut/Matang and Dindings represent a "spill over" from the Kinta district. The most outstanding example of a centripetal pattern of development is the Klang Valley. The large number of approved projects to be located within Kuala Lumpur district (at Setapak, Ulu Klang and Sungei Way) and outside the district (within Ulu Langat, Seremban and Kuala Selangor districts) reflects the growing influence of the Klang Valley industrial region.

Dispersion of industry into Batu Pahat, Muar and Malacca Central appears to provide another 'nucleus' of regional industrial growth since the impact on these districts of the urban-industrial centre of Johore Bahru in the south, is not as strong as that of Kuala Lumpur on the districts in the centre.

The second issue on dispersion concerns the importance of Development Areas and their impact on industrial dispersion. The Development Areas cover thirty-four districts according to the 1971 designation of Development Areas. Their impact on the relative development

of backward regions have been counteracted by Government investments on the fringe of the "economically dynamic core" areas. Hence the slight spread effects of mobile industry on these Development Areas gave an index of dispersion of 0.234 by mid 1974, and creates doubts as to the ability of achieving regional equality on the basis of the existing set of incentives.

The attractiveness of a region to industry is strongly influenced by a pre-existing set of social and economic characteristics. The question must arise as to whether decentralization of manufacturing industry as a policy prescription for achieving balanced regional economic and social growth without systematic planning in other fields does not imply putting the cart before the horse.

Planned industrial estates and free trade zones will in the future as in the last few years continue to be the leading instruments in the strategy for industrial decentralization. The success of those planned for Development Areas (as proved by empirical data in this chapter) will depend on the ability of the region to generate an attractive industrial environment to lure industries into them and to generate external economies to further attract related industry. Through this process Development Areas should counteract the pull generated by industrial estates in areas outside the Development Areas. If this stage of healthy competition is to be achieved it has to be inferred that the prerequisite for balanced regional growth is not merely decentralization of industrial activity but a sectoral restructuring of the regional economies which

consequently should lead to the decentralization of industrial development.

By suggesting sectoral transformation of regional economies, an imbalance in the regional socio-economic structure is implied. This is investigated into in the next chapter since in the final analysis socio-economic structure encompasses many of the key factors that determine industrial location in a free enterprise economy.

CHAPTER VII

SOCIO-ECONOMIC AND POLICY FACTORS OF INDUSTRIAL LOCATION

7.1 Regional Income Measures

As an a priori hypothesis it was suggested in the last chapter that achievement of equitably distributed, spontaneous industrial growth and industrial development among the regions rests on the prerequisite of minimising differences in the regional socio-economic structure. To test this hypothesis, it is imperative to examine the regional economies, their contribution to the West Malaysian economy and the regional social and economic structure.

How does one measure regional socio-economic well-being? According to Avon Bendavid, 'Regional income measures provide indicators of personal and community welfare and economic growth.'[1] Relating this idea to the Malaysian field, it seems that in the First Malaysia Plan, the usefulness of 'income' as an indicator is implied in the statement 'one of the pressing socio-economic problems in Malaysia is the uneven distribution of income.'[2] The Second Malaysia Plan has as its objective the aim of 'reducing and eventually eradicating poverty, by raising

---

1. Bendavid, Avon. Regional Economic Analysis for Practitioners, Praeger Publishers, Praeger Special Studies in International Economics and Development. New York, 1972, P. 29.

2. Malaysia, First Malaysia Plan. 1966 to 1970, Kuala Lumpur, Government Printers, 1965, p. 1.

income levels....of all Malaysians'.[1] Despite this accepted emphasis on 'income' as an indicator of social and economic welfare of individual citizens, paucity of data on income disaggregated at the district-level is a dilemma confronting the researcher.

The Malaysian National Accounts have been intended primarily to measure increases in the national product rather than to measure its distribution.[2] More effort has gone into analysing the forces that limit production and the means of promoting growth than the question of spatial distribution of growth processes and growth efforts.

The approach so far has been centred on a district-level analysis, but a serious dearth of available income statistics disaggregated to the district-level, influences the approach adopted in this chapter. The Economic Planning Unit (E.P.U.) made available unpublished income statistics for the States of West Malaysia, but these, although a useful source of basic data, do not suffice since the State's contribution to GDP masks intra-state variations in the level of income per head. As a result, the approach adopted here is aimed at quantifying, using various available sources of data, income at the district-level so as to prove that income variations exist. This data will then be studied in relation to spatial variations in sectoral structure, employment, population, ethnicity, urbanisation,

---

1. Malaysia, Second Malaysia Plan, Op.cit., P. 1.

2. Lim Lin Lean, 'Some Aspects of Income Differentials in West Malaysia', Monograph Series in Malaysian Economic Affairs, 1971, P. 1 and 2.

public policy and other related socio-economic characteristics.

To compensate for the limitations likely to be imposed by the paucity of data on the derived per capita income, data on income is substantiated by other social and economic measures indicative of income differentials.

The method used in deriving per capita income at the district level is the production approach. It measures 'initial' income that results from production and omits secondary distribution after transfers, voluntary and involuntary. This approach is adopted from the Malaysian National Accounts, because the basic data source in this exercise, the National Accounts, adopt the production approach. The National Accounts provide data on GDP by industrial origin based on the computed value added in a particular sector.

Using the Malaysian National Accounts, the E.P.U. made estimates of the State GDP by proportioning thevalue added for each sector according to the output which could be attributed to the State and on the basis of salaries paid in services. By this process it ruled out inter-state transfer of funds. EPU also assumed uniform values of inputs and outputs per unit of production for all states.

The district GDP of all the seventy districts in West Malaysia is estimated using the EPU's estimates of State GDP. But a procedure similar to that applied for deriving the State GDP could not be used owing to the lack of data on sectoral output at the district-level. The only data available at the district-level are the numbers

employed according to sector.[1] Assuming the productivity of labour to be the same among all districts for each sector, the value added of each sector of the State's GDP is proportioned out to each district according to its share of the corresponding sectoral employment of the corresponding State.

Whenever data on subsectors are available use is made of them to obtain a more refined breakdown; for example, in the agriculture, forestry and fishing sector, State GDP is estimated by nine subsectors and since employment data on the subsectors are available, district GDP for each subsector is calculated separately before aggregating to obtain the sectoral contribution of each district.

Additional data on three sectors enable estimates to be made differently. In the manufacturing sector, in addition to employment, value added in manufacturing by districts is given in the Survey of Manufacturing Industry, 1970. These data are used to calculate district's manufacturing estimates. The disadvantage of using the survey is that it tends to cluster the industrially weak districts under the category classified "others". Underestimation in this sector, for these districts occurs, but as their contribution is relatively very small the distortion effects are negligible.

In the wholesale and retail sector the data on employment are weighted by a ratio of 3.6 to 1.0 for wholesale

---

1. Unpublished data collected by the Statistics Department, West Malaysia, as part of the 1970 Population Census of Malaysia, made available by EPU.

and retail trade. This ratio is based on the average wage per worker derived from the 1970 Census of Wholesale and Retail Trade in Urban Areas of Peninsula Malaysia. According to the Census the wage paid to a worker in wholesale trade is 3.6 times the wage paid to a worker in retail trade.

For estimating the value of the sector classified 'ownership of dwellings' employment data cannot be used. Using the 1970 Housing Census, a district level breakdown of the number of units of different types of living quarters (urban detached, urban multiplex, urban room, rural detached, rural multiplex and rural room) is compiled. Each of these units is then weighted by the value estimate applied by EPU for deriving the State contribution.[1] The weighted district aggregate of living quarters is used to apportion the State's value of ownership of dwellings to the corresponding district's share.

Hence, based on the procedure outlined, the District GDP for 1970 was estimated. Dividing the district GDP by the district's population in 1970, the per capita GDP at the district-level was obtained (Appendix A7.1).

The limitations of the assumptions have to be noted in judging the reliability of the estimates. Fundamentally, the procedure of deriving district GDP was possible only on the assumption of identical productivity of labour

---

1. EPU applied the following weights to arrive at the weighted number of living quarters in estimating the State's value added to 'Ownership of Dwellings': urban detached - 12, urban multiplex - 8, urban room, rural detached, rural multiplex - 2; rural room - 1.

in all the districts for each of the sectors. Furthermore, labour is just one of the factors of production, thus, income of districts with capital-intensive sectoral structure tended to be underestimated, while incomes in labour-intensive districts tended to be overestimated. In the manufacturing and wholesale and retail sectors these assumptions did not apply so that the drawbacks of these assumptions were lessened.

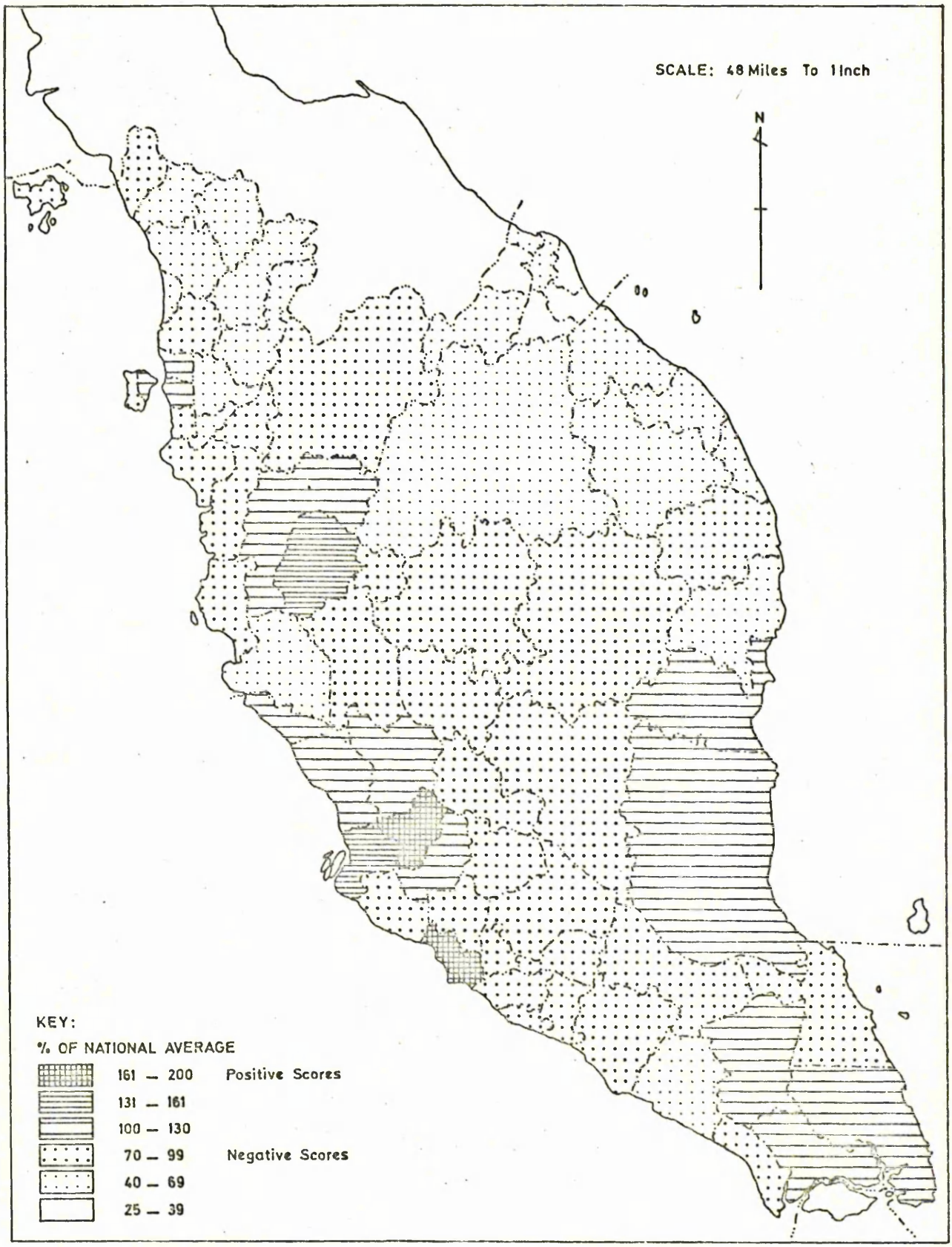
Another consideration was that estimates were based on GDP at current prices. Actual differences in price levels could bias the results, for example, the cost of living is normally lower in agricultural regions.[1] If this feature is taken into consideration then an underestimation of income in the developed districts resulting from uniform productivity of labour is a closer approximation to real income than a distortion of it. Bearing these limitations in mind, the estimates will be used as a reliable and realistic index of relative similarities or differentials in income between districts rather than a set of absolute data on regional income or as absolute differentials between districts.

Figure 7.1 shows the relative levels of the district per capita incomes of West Malaysia for 1970. Per capita income (GDP) differentials are derived by expressing the per capita district GDP as a percentage of the West Malaysian average per capita GDP. The range in the district per capital GDP varies from twice the national average in Kuala Lumpur district (199.2%) to as low as 36 per cent of

---

1. Lim Lin Lean, Op.cit., P. 38.

Fig: 7.1 RELATIVE LEVELS OF GROSS DOMESTIC PRODUCT PER CAPITA DISTRICTS OF WEST MALAYSIA. 1970



the national average in Bachok district in Kelantan. Fifty-three of the seventy districts had per capita incomes below the national average. Among these, nine districts had incomes 50 per cent below the national average. All these nine districts are located in the east coast states of Kelantan and Trengganu. Hence, estimates of relative levels of per capita income at the district-level confirmed the regional disparities in the socio-economic welfare of individuals.

The district-level analysis also confirmed that relative income levels varied among the districts of one state as much as they varied among districts of different states. For example, in Selangor the difference between the richest and the poorest district was 102.5 on a relative scale, while in Kelantan the difference between the relatively affluent district and the most backward district was 21.4. This pattern highlights not only the drawbacks of using State-level analysis which tends to mask intra-state variations but it emphasises the difficulty of planning for an equitable distribution of development. The problems of spatial economic disparities are not merely straight-forward differences in relative levels of incomes between the developed and the less developed States, but these problems are compounded by spatial polarization of relatively high incomes in one or a few of the districts in the so-called developed and relatively affluent States.

If the districts are compared as components of individual States, then Selangor, as expected, had six districts out of seven with incomes above the national

average. Kuala Langat was the only district with a per capita income 3.3 per cent below the national average in 1970. In Penang, three out of the five districts had incomes above the national average. In Johore, Johore Bahru, Kluang and Kota Tinggi were three out of the eight districts with incomes above the national average. In Perak, only the Kinta and the Kuala Kangsar districts were in the favourable category. In the remaining six districts incomes were below the national average. In Pahang and Negri Sembilan, only Kuantan and Pekan in the former State and Port Dickson in the latter State were favourable placed. Their remaining districts together with all districts in Kedah, Perlis, Malacca, Kelantan and Trengganu recorded incomes below the national average.

It is noteworthy that apart from Kuantan and Pekan, all districts with per capita incomes above the national average in 1970 had a predominantly west-coast location.

Based on State-level estimates of per capita GDP, Lim Lin Lean had shown that according to the Williamson index of regional income inequality, the coefficient of income differential amounted to 0.36 in 1965 but rose to 0.37 in 1968, reflecting an increase in the regional inequality in West Malaysia.[1]

---

1. The measure used for calculating Williamson index of regional income inequality is adopted from Lim Lin Lean's 'Some Aspects of Income Differentials in West Malaysia. As she had indicated that there was very little difference in the results of the three formulae or approaches applied, only the weighted coefficient of variation (measuring the dispersion of regional income per capita level relative to the national average weighted by the

Continued on following page...

Using the same procedure (Appendix Table A7.2) it was found that in 1970 the coefficient of State-level inequality amounted to 0.36 reflecting a slight improvement over the 1968 coefficient.

The coefficient of district-level inequality using the district per capita income, relative to the national income and weighted by the district's share of the national population amounted to 0.43. This index confirmed that West Malaysia had significantly high regional income differences.

7.2 Relationship between the Level of Manufacturing and the District per capita GDP

The significantly high coefficient of regional income inequality give strong empirical support for the hypothesis outlined in this chapter. To show that the level of manufacturing at the district-level is related to the relative levels of income a simple linear regression is run, with the component scores of Component I of

---

Footnote 1 continued from previous page:

region's share of the national population) was used. The weighted coefficient of variation is given by the formula:

$$Vw = \frac{\sqrt{\Sigma (y_1 - \bar{y})^2 \frac{fi}{n}}}{\bar{y}}$$

$\bar{y}$ = per capita national income
y_1 = income per capita of i^{th} district
n = number of districts
fi = population of the i^{th} district
n = national population

See. Lim Lin Lean, Op.cit., p. 39.

manufacturing (level of manufacturing 1970) as the dependent variable and the district relative level of GDP (District GDP as a percentage of the national average) as the explanatory variable.

The linear equation obtained is as follows:-

$$y_1 = 1.57 + 0.02x$$

y_1 = level of manufacturing

x = income as a percentage of the national average

r^2 = 0.33

The coefficient of correlation between manufacturing and the district per capita income (relative) is 0.58. Only 33 per cent of the variation in the level of manufacturing is explained by the inoome differences. This suggests that other factors also influence the spatial differences in the level of manufacturing. This regression indicates that although income is an important and atatistically significant explanatory variable of the level of manufacturing, it does not assume overriding importance. The residual variance of 67 per cent is effected by other social and economic indicators or instruments of public policy on industrialization. There is the need to examine these residual factors.

7.3 Socio-Economic Measures

Inoome differentials emphasise the spatial implications of the inherent dualistic character of the West Malaysian economy which appear to have persisted despite the rapid economic development and the changes in

the economic structure after independence.

While it has been shown that income inequality does explain partially the tendency for manufacturing industry to be spatially concentrated in a few favourable districts, the relationship may not be wholly causative, it could be that the causation may and probably does work the other way round and help to improve the level of income, diversify the economy and encourage economies of agglomeration.

Based on these two arguments the sectoral structure of the districts would have to be considered as explanatory variables.

Table 7.1 shows the variations in the districts' sectoral structure by expressing the employment in each sector as a percentage of the districts' total employment in 1970. Concentration of the labour-force in primary occupations (agriculture, forestry, hunting and fishing and modern agriculture requiring processing) was evident in the eastern, north-eastern and north-western districts. In the west-coast districts, as a direct contrast, 40 to 95 per cent of the employees were engaged in the non-agricultural activities.

As indicated earlier very little 'hard' income data are available. To substantiate the estimates of district per capita GDP, other income and social indicators have been drawn upon to overcome the limitations of averaging involved in the calculation of the district GDP.

These additional variables are chosen because information is available for all districts. They are reliable indicators for a major segment of the districts.

Table 7.1. SECTORAL EMPLOYMENT AS A PERCENTAGE OF DISTRICT'S TOTAL EMPLOYMENT, 1970.

Districts	Agriculture, forestry, hunting & fishing	Agricultural Products Requiring Processing	Mining & Quarrying	Manufacturing	Construction	Utilities	Commerce	Transport & Communications	Services	Other Activities
Batu Pahat	9.4	48.4	0.2	6.4	1.2	0.3	8.5	2.5	11.6	9.4
Johore Bahru*	5.5	28.7	0.3	16.8	2.6	1.5	9.5	3.4	23.5	7.2
Kluang*	6.3	50.1	0.0	7.7	1.4	0.6	6.7	2.6	16.6	6.9
K. Tinggi*	17.1	44.5	7.3	3.2	0.9	0.6	5.8	1.7	10.2	7.6
Mersing	26.4	23.8	2.4	5.5	1.5	0.7	10.2	2.4	16.5	9.5
Muar	7.8	53.2	0.2	4.2	1.3	0.4	8.0	2.6	13.3	7.0
Pontian	22.4	38.9	0.0	5.4	0.9	0.2	7.2	1.9	8.9	10.8
Segamat	5.2	59.9	0.1	3.6	1.1	0.4	7.2	2.3	10.5	8.4
Yen	71.8	6.0	0.0	2.7	0.9	0.2	6.0	1.0	6.0	3.1
Baling	24.8	53.8	0.3	1.2	0.4	0.1	4.8	0.7	5.1	6.3
Bandar Bahru	10.7	63.0	0.7	1.3	0.6	0.2	4.6	1.1	8.2	8.2
Kota Star	50.2	9.3	0.1	5.3	1.4	0.4	9.5	2.4	13.7	6.2
Kuala Muda	24.5	33.1	0.8	6.5	1.1	0.3	7.9	2.2	14.5	7.8
Kubang Pasu	68.4	14.3	0.0	1.6	0.2	0.1	4.3	0.7	4.7	3.3
Kulim	8.7	55.6	0.4	4.5	1.1	0.4	7.8	1.9	12.4	6.0
Langkawi	59.2	15.1	0.5	2.5	1.3	0.4	6.0	0.9	9.2	4.3
Padang Terap	70.8	16.2	0.0	0.3	0.4	0.1	2.4	0.4	5.7	2.7
Sik	33.9	51.4	0.1	1.0	0.2	0.1	4.0	0.6	4.9	2.2
Bachok**	61.5	5.0	0.0	14.8	1.9	0.1	6.1	2.0	6.0	0.9
Kota Bahru	36.6	8.1	0.0	11.0	2.7	0.5	10.4	4.3	17.0	8.2
Machang**	33.7	45.9	0.2	3.3	0.9	0.1	5.0	1.4	6.0	2.1
Pasir Mas**	53.9	20.8	0.1	5.8	0.9	0.3	5.5	2.2	7.9	2.1
Pasir Puteh**	60.5	13.8	0.0	5.6	0.8	0.1	5.6	1.6	6.1	4.8
Tanah Merah**	26.9	56.1	0.0	2.3	0.5	0.1	3.6	1.4	5.9	2.7
Tumpat**	61.6	2.8	0.4	9.9	2.0	0.2	8.2	3.6	7.4	2.7
Ulu Kelantan	22.6	58.1	0.1	2.2	0.6	0.4	3.9	2.5	6.0	2.7
Alor Gajah	9.3	52.1	0.3	5.3	1.8	0.4	6.6	2.4	14.6	3.5
Jasin	6.7	62.2	0.9	3.0	0.9	0.4	5.3	1.7	10.1	4.3
Malacca Central	11.4	11.2	0.1	12.0	3.0	1.6	16.0	6.1	26.6	6.4
Jelebu	21.8	49.2	2.5	2.0	0.9	0.5	5.0	1.3	11.4	2.1
Kuala Pilah	13.8	49.1	0.1	3.3	1.0	0.4	7.4	1.9	11.9	4.0
Port Dickson*	6.9	42.2	0.4	4.2	1.6	1.6	4.9	1.8	29.1	4.3
Rembau	21.8	45.5	0.0	1.8	0.5	0.1	4.8	1.1	9.3	5.8
Seremban	5.4	38.0	0.5	10.6	2.4	0.9	13.4	4.6	24.3	12.1
Tampin	6.1	53.4	0.1	4.3	1.1	0.8	4.9	5.2	13.9	4.3
Bentong	10.7	56.3	0.6	4.6	1.9	0.5	6.6	1.6	14.1	1.5
Cameron Highlands	34.2	35.0	0.3	1.2	1.7	1.7	3.9	2.4	14.1	2.6
Jerantut	34.2	37.3	0.2	4.6	0.7	0.1	5.1	0.9	8.8	2.7
Kuantan*	11.0	16.4	7.7	8.6	3.3	0.6	10.1	3.3	25.9	6.4
Lipis	27.0	38.3	0.4	1.9	0.7	0.4	5.5	2.5	10.6	3.5
Pekan*	30.0	22.8	6.8	5.2	0.9	0.3	7.8	1.9	12.2	3.6
Raub	28.4	37.5	0.6	5.0	1.2	0.8	4.9	1.5	10.4	3.1
Termeloh	16.3	48.2	0.1	4.3	0.8	0.4	7.0	1.5	11.0	3.6
Bukit Mertajam*	19.8	12.5	0.8	16.8	2.6	1.0	11.8	7.5	14.7	6.4
Butterworth*	32.2	6.8	0.1	16.4	2.1	0.8	10.5	4.5	15.2	6.4
Nibong Tebal	26.4	29.4	0.1	8.0	1.2	0.6	9.8	2.8	12.3	5.0
Penang N.E,*	2.8	0.7	0.2	13.8	3.6	1.1	21.1	8.4	31.4	8.4
Penang S.W.	30.8	12.7	0.3	3.8	1.0	0.8	7.9	4.4	13.4	11.0
Batang Padang	7.3	44.3	10.5	3.5	1.0	1.1	7.5	2.5	12.2	8.8
Dindings	20.8	39.8	0.4	7.4	1.5	0.4	7.7	1.8	12.6	6.1
Kinta*	4.7	7.7	15.7	15.1	3.5	1.7	14.0	3.6	23.7	9.4
Krian	58.9	14.1	0.0	2.9	0.6	0.2	6.5	1.3	7.3	6.0
Kuala Kangsar*	18.4	45.1	1.1	3.7	1.0	0.7	7.3	1.8	13.7	6.1
Larut/Matang	15.5	32.8	2.2	8.4	1.8	0.8	9.5	2.7	17.8	7.5
Lower Perak	27.7	29.9	1.1	6.2	1.4	0.3	8.6	2.4	11.7	9.2
Upper Perak	23.3	47.1	3.1	1.2	0.6	0.4	4.7	3.7	11.0	5.3
Perlis	64.5	6.0	0.7	2.6	0.7	0.3	6.4	1.6	9.2	2.7
Klang*	5.6	18.9	0.7	15.9	2.9	1.3	11.2	13.0	16.2	7.9
Kuala Langat	12.6	51.8	0.4	3.3	1.2	0.2	5.7	2.0	10.0	4.9
Kuala Lumpur*	1.8	3.0	1.9	19.2	5.6	1.3	16.7	6.1	33.5	6.0
Kuala Selangor*	43.2	25.8	2.5	2.8	0.6	0.1	5.0	1.0	7.4	4.5
Sabak Bernam*	42.7	24.5	0.0	3.1	1.3	0.3	6.8	0.8	9.6	2.0
Ulu Langat*	5.3	41.1	3.9	6.7	2.5	0.7	6.3	2.5	13.9	6.9
Ulu Selangor*	4.8	47.4	8.0	4.5	1.2	0.6	6.4	2.1	13.1	6.1
Besut**	55.5	18.9	0.1	5.4	1.1	0.1	6.0	1.7	7.7	2.9
Dungun	26.4	15.8	15.3	6.8	2.1	0.3	9.9	3.9	12.9	5.9
Kemaman	25.0	38.5	3.8	5.7	1.0	0.3	8.4	2.0	10.7	4.3
Kuala Trengganu**	32.4	11.3	0.4	16.1	2.8	0.3	10.4	3.9	15.2	6.5
Marang**	54.0	11.3	0.1	18.5	1.3	0.0	6.3	0.9	6.0	1.3
Ulu Trengganu	64.2	23.3	0.2	1.0	0.4	0.1	3.0	0.5	4.4	2.3

* Districts with per capita GDP above the national average.

** Districts with per capita GDP below 50% of the national average.

However, it has to be emphasised, that taken individually none of them measures adequately the social or economic welfare. Indicators which function as reasonable indicators of income in urbanised areas may have very low priority in rural areas, for example, domestic telephones per thousand population. This indicator taken on its own would fail to differentiate within rural areas.

Five indicators are chosen to show regional economic differences. These are:-

1) motor car ownership per thousand of the district population
2) motor cycle ownership per thousand of the district population
3) Man-land ratio expressed as persons per acre of alienated agricultural, urban or estate land
4) Banking facilities
5) Accessibility expressed as square miles of territory served by one mile of road

Motor car and motor cycle ownership weighted by the district population has been selected because of its universal coverage of both urban and rural areas.[1] It reflects income and economic well-being.

Since both rural and urban areas are intertwined in a district-level analysis, the impact of urban and rural settlements, population distribution and economic activities of agricultural land use and resource development could be

---

1. Simonsen, O.C., Indicative Urban and Non-urban Income Disparities in Peninsula Malaysia and its Implications for Development, E.P.U. Special Projects Section, 1975, P.4.

summarised as man-land ratio expressed as persons per alienated acre of land.

Highest density is recorded in Penang north-east reflecting the urban density of Georgetown. It is followed by a high density in Kuala Lumpur district, indicative of the impact of the largest urban centre in West Malaysia and of medium and small towns in the district. Kinta district and Malacca Central have densities of 3 to 4 persons per acre. The former reflect a highly urbanised and tin-mining settlement coupled with high densities in the traditional, rural and agricultural hinterland. Malacca Central reflect the concentration of the urbanised population of Malacca state.

The districts of Kota Bahru, Kuala Trengganu, Dungun and Kuantan have densities equal to those in Bukit Mertajam and Butterworth. They exceed the densities of Klang, Seremban, Johore Bahru, Muar and Batu Pahat, despite the larger medium sized urban centres in the latter districts. These net densities highlight the basic structural differences between the districts in the south and the south-west and those in the north and the north-east.[1] The south although dominated by large and medium size urban centres have supporting rural hinterland in which the densities are low because of extensive tree crop cultivation while in the north-east and the north-west the rural densities in areas of traditional rice-crop cultivation are high, although the urban centres

---

1. Simonsen O.C., Land-use and Density Factors. Part 3 of Urbanisation in Peninsula Malaysia. Special Projects, E.P.U., Nov. 1973, P.5.

are small. Similarly, districts with no major urban centres[1] such as Pekan, Besut, Marang in the east coast and Padang Terap, Sik, Krian and the Dindings in the north-west have densities that equal or exceed the densities of the districts of Klang, Johore Bahru, Muar and Seremban.

Hence high densities may result from two diverse patterns of land-use, both urban agglomerations and traditionally rural and backward agricultural districts. As the distribution is complex, there is difficulty of using it as a variable in factor-analytic methods of data summarising. As such it is omitted from subsequent analysis.

Banking facilities is another indicator chosen since it is an important factor in industrial transactions. Absence of banking facilities in predominantly agricultural and low income districts is noted while banks and their branch offices tend to cluster in high income urbanised[2] districts.

Road density is both an economic and a social indicator of regional disparities. It is a basic infra-structural factor in industrial location, facilitating the link between raw materials and other inputs, production points and markets in the basic skeleton of the production process. Extensive areas of undeveloped territory tend to inflate the scarcity of road facilities in districts such as Ulu Kelantan and Upper Perak.

---

1. Simonsen, Op.cit., p.5.

2. A district can be classified 'urban' if 50 per cent or more of its population is living in urban centres of over 10,000 population size. The cut off point at 10,000 persons is adopted from the Malaysian Socio-Economic Sample Survey of Households, 1967/68.

In the West Malaysian context it is not a discriminative variable owing to the small land area of the country; very few areas are isolated. The concerted effort of the Government to provide amenities and infra-structural facilities in rural areas shows itself in that the differences in data on accessibility are small at the district-level. Extension of modern agriculture, mining and timber extraction are associated with the development of road networks. Owing to these reasons the district-level differences in road density are not explanatory. As such this variable is omitted from subsequent analysis. (Table A 7.3).

In addition to these economic indicators, data have been compiled on five social indicators. These include percentage of houses with piped water, percentage of houses with electricity, percentage of houses classified 'good' in the Housing census, the number of domestic telephone lines per thousand of the district population and electricity consumed per head (in urban centres with 10,000 population size and above, in each district). These five indicators have been selected as they show an increasing level of affluence among the people of West Malaysia. Data on electricity consumption is not available at the district-level. Data are confined to urban centres of over 10,000 population size. Within districts, data on urban centres is weighted by the population in the urban centres of the corresponding districts to arrive at per capita electricity consumption in urban areas of districts.

Demographic characteristics of the districts are important social indicators. Considerable attention has

been placed in the Second Malaysia Plan on policies and problems of the communal imbalances in space and in occupational structure. It would be useful to analyse the importance these play in explaining regional structural differences. For this purpose data are extracted from the population censuses of 1957 and 1970. The demographic indicators selected are: total district population in 1970, the Malay, Chinese and Indian population as percentages of the district population, percentage change in the distribution of Malay population between 1957 and 1970 by districts and the percentage of rural population in each district. The last indicator needs to be defined. Although the urban definition of population in centres with a threshold population of over 10,000 is adopted according to the Socio-Economic Sample Survey of Households, yet to obtain a more refined distinction of rural areas, a population threshold size of 5,000 and below is used.

The district-level disparities on the basis of the urban-rural division are distinct. In 54 districts 70 to 100 per cent of the population is rural according to the above definition. This reflects to some extent the considerable emphasis placed by the Government in the 1960's on rural development and land development schemes rather than on urban development as a basis for restructuring society.

With regard to the ethnic composition of the district population, the concentration of the Malay population in the east-coast districts and the concentration of immigrant races in the west-coast districts is clearly marked. In the nine districts with incomes below 50 per cent of the

national average, 90 per cent or more of the population of each district is Malay. In the districts with incomes above the national average are concentrated 55.2 per cent of the Chinese population and 55.6 per cent of the Indian population, while only 26.8 per cent of the Malay population are settled in them. At the other extreme, in the districts of Kedah, Perlis, Kelantan, Trengganu and Pahang are settled 45 per cent of the Malay population of West Malaysia.

Despite the fact that the geographical distribution of population by ethnic groups reflects their spatial polarization, efforts have been made by the Government since independence to re-organise the spatial distribution of society. The percentage change in Malay population between 1957 to 1970 is an important variable to measure the impact of policy on the regional demographic structure.

Between 1957 and 1970 population increased at the rate of 2.6 per cent but Malay population increased at the rate of 3.8 per cent[1] in urban centres of 50,000 to 100,000 population size. This increase has been attributed to rapid in-migration of Malay population to urban centres.[2] The percentage of Malays increased from 16 per cent to 22 per cent in centres of over 100,000 population size, which is a substantial increase considering the number of persons it represents.[3] The data also shows that the net effect of this

---

1. See, Simonsen, O.C., This high rate of increase has been brought about by rapid inmigration. 'Population Distribution and Growth Patterns' in Urbanization in Peninsula Malaysia, Part I, Nov. 1973, p. 67-70.

2. Ibid., 51 and 52.

3. Simonsen, O.C., 'Population Distribution and Growth Patterns', in Urbanization in Peninsula Malaysia, Part I, E.P.U. Special Projects. Nov. 1973, p. 50.

in-migration of Malays to urban centres took place in the districts of Kuala Lumpur, Johore Bahru, Tampin, Kluang, Bentong and Kuantan.

Rural and agricultural districts also saw rapid increase in population brought about by migration. Kubang Pasu, Baling, Sik and Padang Terap shared high gains. This can be accounted for by land development projects in these districts.[1] Emphasis on agricultural projects initiated by FELDA also accounted for the large increase in population in Tanah Merah, Ulu Kelantan and Dungun during the inter-censal period.

The distribution of urban centres of different sizes by districts is another indicator that has been computed to depict regional urban disparities. The distribution of towns of I0,000 to 20,000, 20,000 to 50,000, 50,000 to I00,000 and over I00,000 population sizes have been compiled.

Urban population in centres of over 10,000 population size by districts has also been compiled as a percentage of the district population for 1957 and 1970. The percentage change in urban population during the inter-censal period 1957 to 1970 is also considered. The district urban population as a percentage of the State urban population is another variable derived from the data. (table A7.3).

Compilation of these variables has been based on the rationale that in West Malaysia as in most developing

---

1. Cheng Ban Lian, 'Central Place Perspectives in a Transitional Agricultural Region: The Case of Kedah/Perlis, Unpublished M.A. Thesis, 1975, P. 202.

countries the manufacturing sector is a recent development which has tended to coincide with existing urban centres. Thus a distribution of urban centres and urban population should explain the spatial pattern of manufacturing industry if the relationship is significantly and positively causal and locational.

7.4 Public Policy Indicators

In the West Malaysian context regional social and economic viability have not been the only set of factors influencing industrial location. Public policies have been designed to accelerate industrial growth and give direction to industry. This is a phenomenon not unique to West Malaysia. Both the developed[1] and developing countries[2] are known to tamper with industrial locational forces to avoid industrial concentrations and to redress problems of depressed and declining regions.

The Public policy could have distributive effects on industrial location. It could either reinforce regional disparities if it is allied to regions with greater economic opportunity and economic centrality or it could compensate for the economically less attractive environments and thus aim at restoring regional equality of opportunity.

Examples are found in,

1. Manners, G., Keeble, D., Rodger, B., Warren, K., Regional Development in Britain, John Wiley and Sons, 1972, P. 5 & 6. Walker, D.F., 'Government Influence on Manufacturing Location: Canadian Experience with Special Reference to the Atlantic Provinces'. Regional Studies, Vol.9, P. 203-217.

2. Committee on Economic Development, 'Economic Development Issues: Greece, Israel, Taiwan and Thailand', Supplementary Paper No. 25, (Praeger Special Studies in Internaticnal Economics and Development) 1968. P. 64, 146, 147.

While it has been possible to outline the strategy and aspects of industrial policy, attempts to obtain quantifiable indicators of public policy influencing industrial location and development at the district-level have met with considerable difficulty. Indicators which are considered highly desirable on a theoretical basis, had to be omitted from the empirical study as data are not available. The selection of indicators from various sources is guided by the ability to compile reliable data with a complete district-level coverage.

Ideally district-level expenditure on different aspects of assistance would have been preferred. But failure to obtain these data meant that indirect indicators such as the number of industrial estates, allocated and unallocated acreage had to be resorted to. Since industrial policy took a sharp turn after 1969, wherever possible data on industrial indicators have been compiled according to the initial and post-1969 time periods, taking this change into consideration. But whether the policy differences have any spatial implications is another matter and is left to be discussed in the subsequent analysis.

The indicators chosen to quantify and measure industrial policy by districts are as follows:-

1. The presence of industrial estates weighted by the number of industrial estates developed by July 1974.
2. The presence of free trade zones weighted by the number of free trade zones in each district as at July 1974.
3. Total saleable acreage of land in industrial estates in each district.

4. Allocated acreage as a percentage of saleable acreage.
5. Percentage of unallocated acreage of land.
6. Total saleable acreage of free trade zones in each district by July 1974.
7. Percentage of allocated acreage of free trade zone land.
8. Percentage of unallocated free trade zone land.
9. Distribution of manufacturing establishments enjoying Pioneer Status as at July 1974.
10. Distribution of manufacturing establishments granted LUR.
11. Distribution of loans by value, awarded by Malaysian Industrial Development Finance Limited (MIDF) up to 1969 for factory mortgage, hire purchase and long term project loans.
12. Distribution of MIDF loans by value awarded between 1970 and 1974.

The first eight indicators have been selected because industrial strategy laid emphasis on the creation of free trade zones and industrial estates as a means of providing suitable physical and infra-structural facilities for rapid industrialization and possibly industrial decentralization. A breakdown into the pre-1969 and post 1969 time periods is not practical since industrial estates planned in the initial period were not necessarily fully established during that period. In free trade zones this problem does not arise as all of them were developed in the 1970's. The percentage of allocated and unallocated acreage is perhaps a better measure of the successful implementation

of this strategy. These two variables should reflect the socio-economic conditions of the region in which the industrial estate or free trade zone is located. This relationship could also help to ascertain if the setting up of industrial estates and free trade zones is all that is necessary to counterbalance the adverse socio-economic conditions of a region and bring it at par with the economically advanced regions.

Apart from the physical incentives, fiscal and tax incentives have been included as policy measures. Data on the distribution of pioneer status and labour utilization relief are two sampled indicators of these incentives but a breakdown for the pre-1969 and post-1969 period could not be obtained.

In an attempt to quantify distributive aspects of industrial financing data on the distribution of loans, financed by the Malaysian Industrial Development Finance Limited (MIDF) have been compiled as a sample of the institutions responsible for financing the manufacturing sector.[1]

The data on these twelve indicators of the major aspects of industrial policy (physical and infra-structural facilities, tax incentives and loan financing) were compiled.

---

1. The distribution of MIDF loans is based on approved loans rather than loans executed because data on the individual loans is recorded by MIDF on the basis of approvals. But it was observed that approved loans were generally executed in phases within six months to one year of the date of approval. To further reduce the differences between approvals and loans actually executed, all approved loans which were cancelled by the time the data were compiled, were omitted.

Together with thirty-three variables indicating social and economic difference, a data summarising procedure is used to obtain a few orthogonal components denoting spatial variations in socio-economic structure and industrial assistance.

7.5 The Component Analysis

As the primary forty-five variables are inter-related, component analytic technique is applied to simplify and isolate a new set of significant components that summarise the information while removing the element of multi-colinearity.

The matrix of product-moment correlation coefficients Table 7.2 shows that a large number of positive significant correlations exist among the original variables.[1] The GDP per capita and social welfare indicators and economic indicators are positively correlated at the 99 per cent confidence level. GDP and employment in different sectors also outlines significant causal relationships. A coefficient of -0.55 between per capita GDP and employment in traditional agriculture indicates the low productivity of the latter. High positive correlations between employment in construction activity, commerce, utilities and transport reflect the employment generating ability of the non-agricultural sectors and the propensity for growth into related activities

---

1. Only correlations above $\pm$ 0.32 are significant at the 95 per cent probability level for a sample size of 70.

Table 7.2. CORRELATION MATRIX OF FORTY-FIVE SOCIO-ECONOMIC AND INDUSTRIAL POLICY INDICATORS

Indicators	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	4
1. Per capita G.D.P.	1.00																																												
2. Cars per thous. pop.	.68	1.00																																											
3. Motor cycles per thous. pop.	.59	.56	1.00																																									
4. Banks	.54	.77	.37	1.00																																								
5. Electricity per capita	.65	.56	.35	.49	1.00																																							
6. % of houses with pipe water	.55	.63	.54		.32	1.00																																					
7. % of houses with electricity	.70	.84	.62	.58	.48		1.00																																				
8. % of houses classified good	.51	.59	.48					1.00																																			
9. Domestic telephone lines/thous. pop.	.53	.86	.47	.91	.53				1.00																																		
10. % of empl. in agri., forestry etc.	-.55	-.59	-.49			-.54	-.70	-.64	-.39	1.00																																	
11. % of empl. in agricultural processing								-.35		-.54	1.00																																
12. % of empl. in mining	.34											1.00																															
13. % of empl. in manufacturing	.57	.60	.51	.52	.58	.60	.60	.51	.71		-.55		1.00																														
14. % of empl. in construction	.53	.80	.41	.75	.49	.38	.72	.46	.83	-.39	-.45		.78	1.00																													
15. % of empl. in utilities	.66	.77	.43	.47	.58	.69	.82	.59	.58	-.52			.41	.64	1.00																												
16. % of empl. in commerce	.40	.69	.43	.66	.32	.36	.71	.44	.82	-.38	-.47		.69	.82	.54	1.00																											
17. % empl. in transport	.43	.57		.47	.33	.43	.63	.37	.58	-.39	-.32		.61	.68	.58	.71	1.00																										
18. % of empl. in services	.67	.88	.52	.67	.66	.58	.84	.58	.81	-.60			.53	.82	.79	.78	.59	1.00																									
19. % of empl. in other activities										-.35				.49					1.00																							
20. Population 1970	.50	.55	.42	.90	.47		.59		.85	-.33				.72	.45	.69	.45	.64		1.00																						
21. % Malay pop.	-.68	-.74	-.68	-.40	-.37	-.81	-.86	-.67	-.50	.72				-.47	-.73	-.47	-.45	-.66		-.42	1.00																				
22. % Chinese pop.	.65	.74	.70	.44	.34	.80	.87	.67	.55	-.72				.51	.71	.55	.46	.69		.45	-.96	1.00																			
23. % Indian pop.		.37				.34	.40			-.33					.37			.35			-.43		1.00																	
24. % of rural pop. (< 5000)	-.48	-.77	-.51	-.65	-.41	-.53	-.74	-.51	-.82	.52			-.65	-.81	-.61	-.84	-.68	-.79		-.69	.57	-.62		1.00																	
25. % change in Malay pop. (1957-70)	.47	.46		.51	.38		.31		.45	-.33				.39				.40		.36				-.39	1.00																
26. Towns 10-20,000		.37			.35		.36		.43				.47	.46	.35	.50	.33	.45		.36			.32	-.54		1.00															
27. Towns 20-50,000	.37	.49	.40	.42		.32	.49	.38	.50	-.31			.32	.50		.41		.46		.44	-.42	.45		-.49			1.00														
28. Towns 50-100,000				.40					.44				.39	.43		.47		.40		.51				-.45		.49		1.00													
29. Towns 100,000	.51	.69	.35	.70	.38	.39	.55	.33	.72	-.31			.56	.64	.56	.59	.59	.57		.71	-.41	.43		-.66	.42		.33		1.00												
30. % change in urban pop. (1957-70)		.43		.38			.34		.46				.56	.60		.50	.39	.51		.48				-.65		.55		.60	.33	1.00										
31. % urban population 1970	.38	.69	.44	.58	.41	.39	.60	.40	.73	-.41			.59	.70	.51	.71	.54	.69		.61	-.41	.47		-.85	.37	.58	.42	.41	.57	.68	1.00										
32. % urban population 1957	.44	.78	.50	.69	.39	.44	.67	.42	.86	-.42	-.33		.65	.78	.55	.83	.66	.75		.70	-.47	.53		-.90	.39	.50	.49	.42	.67	.60	.85	1.00								
33. % of state urban pop.		.66		.62	.36		.54		.77		-.37		.58	.75	.47	.79	.50	.74		.65		.36		-.79		.60	.32	.68	.44	.71	.75	.78	1.00							
34. M.I.D.F. loans (until 1969)	.55	.68	.36	.83	.49		.51		.74				.57	.65	.44	.48	.39	.51		.78	-.34	.37		-.52	.50		.32	.36	.64	.35	.47	.56	.39	1.00							
35. M.I.D.F.loans in 1970s	.56	.61	.33	.58	.47		.55	.38	.60	-.31			.67	.63	.55	.54	.63	.49		.62	-.42	.43		-.58	.35	.33		.36	.62	.37	.50	.61	.34	.73	1.00						
36. No. of Ind'l estates	.41	.65		.61	.42		.50		.64	-.32			.56	.67	.49	.61	.50	.63		.68		.36		-.63	.34	.39	.32	.50	.49	.63	.62	.66	.68	.59	.64	1.00					
37. No. of FTZ	.43	.40		.49	.38		.43		.41				.42	.43	.37	.34	.52			.42					.33				.43			.33		.50	.64	.51	1.00				
38. Acreage of ind'l estates	.34	.46			.32		.40		.38					.42	.47	.41	.52	.40		.37				-.54				.32	.51	.52	.49	.52	.37	.51	.70	.64		1.00			
39. % of allocated acreage - ind. estate	.45	.66	.35	.58	.39	.35	.56	.39	.66	-.37			.60	.67	.55	.64	.60	.62		.68	-.41	.44		-.64		.36	.36	.38	.64	.49	.65	.69	.59	.55	.72	.81	.50	.63	1.00		
40. % of unallocated acreage - " "																.32												.44		.42			.35			.41			1.00		
41. Acreage FTZ							.39		.34							.34															.34			.45	.39		.34	.54			1.00		
42. % of allocated acreage FTZ	.46	.59		.72	.39		.52		.69		-.34		.49	.60	.48	.60	.71	.53		.60	-.34	.37		-.53	.37				.61		.46	.59	.49	.64	.57	.54	.54	.45	.46		.40	1.00		
43. % of unallocated acreage FTZ							.34									.33													.37			.39			.33			.51		.35	.73	.35	1.00		
44. Pioneer industry	.61	.68		.86	.55		.51		.72				.56	.66	.48	.47	.52	.52		.78	-.35	.36		-.50	.55				.72	.34	.45	.55	.38	.90	.78	.64	.72	.48	.61			.74		1.00	
45. Industry with LUR	.55	.51		.49	.37		.46		.46				.56	.59	.46	.44	.60	.44		.56	-.35	.34		-.52	.35				.64	.49	.43	.49	.34	.52	.77	.63	.60	.57	.75			.44		.68	1.0

Note: Only correlations $\geq \pm .32$ are tabulated as this value is significant at the 95% probability level for a sample size of 70.

resulting from external economies of agglomeration. Positive linear correlations at the 99 per cent confidence level are also prevalent among the urban variables and non-agricultural activities and the concentration of physical and fiscal incentives for industrial development. These correlations reflect a locational relationship between urbanisation, varied employment opportunities and industrial assistance. Malay population is correlated with rural districts and traditional agriculture and negatively correlated with immigrant population and non-agricultural activities. (These correlations are also significant at the 99 per cent confidence level.) This pattern reflects a dichotomy along ethnic-occupational lines.

Based on the correlations, the component analysis extracts eight components with eigen values greater than one. These eight components account for 78.9 per cent of the variance in the data (Table 7.3). Of these eight components, the first component extracts the maximum amount of variance (45.1 per cent) from the basic correlation matrix. The subsequent three components extract five per cent or more of the residual variance each. Since the first four components extract two-thirds of the variance, cumulatively, and as the remaining components add very little information, each, they are omitted and only the first four components are used in subsequent analysis.

Table 7.4 gives the matrix of component loadings. The higher the percentage contribution to total variability of the component, the stronger is the power of identification possessed by the variables that load highly on that component.

Table 7.3 COMPONENTS EXTRACTED: COMPONENT ANALYSIS

Component	Eigenvalue	% of Variance Extracted	Cumulative % of Variance
I	19.85	45.1	45.1
II	4.12	9.4	54.5
III	3.00	6.8	61.3
IV	2.21	5.0	66.4
V	1.64	3.7	70.1
VI	1.42	3.2	73.3
VII	1.34	3.1	76.4
VIII	1.13	2.6	78.9

Note Only the first four components each explaining 5% or more of the variance in the data are used for subsequent analysis.

Table 7.4. MATRIX OF COMPONENT LOADINGS

Primary Indicators	Components I	II	III	IV
1. Per Capita G.D.P.	.58	.64		
2. Cars per thous. pop.	.52	.64	.41	
3. Motor cycles per thous. pop.		.68		
4. Banks	.73		.44	
5. Electricity used per head	.54	.39		
6. Percentage of houses with pipe water		.82		
7. % of houses with electricity	.33	.80		
8. % of houses classified as good		.74		
9. Domestic telephone lines/thous. pop.	.57	.38	.58	
10. % of empl. in agri., forestry etc.		-.77		
11. % of empl. in agri. req'g processing	-.33	.35		-.38
12. % of empl. in mining				
13. % of empl. in manufacturing	.58			
14. % of empl. in construction	.54	.34	.59	
15. % of empl. in utilities	.39	.69		
16. % of empl. in commerce		.34	.68	
17. % of empl. in transport & comm.	.46	.32		
18. % of empl. in services	.37	.63	.54	
19. % of empl. in other activities				
20. Population 1970	.65		.53	
21. % Malay pop.		-.92		
22. % Chinese pop.		.88		
23. % Indian pop.		.44		
24. % rural (< 5000)	-.32	-.46	-.66	
25. % change in Malay pop.	.57			
26. Towns 10-20,000			.71	
27. Towns 20-50,000		.36		
28. Towns 50-100,00			.76	
29. Towns over 100,000	.66			
30. % change in urban pop. 1957-70			.75	
31. Urban pop. 1970		.32	.68	
32. Urban pop. 1957	.39	.36	.64	
33. % of state urban pop.			.89	
34. MIDF loans until 1969	.81			
35. MIDF loans in 1970s	.76			
36. No. of industrial estates	.56		.56	
37. No. of F.T.Z	.73			
38. Acreage of industrial estates	.43			.49
39. % allocated acreage in ind. estates	.58		.44	
40. No. unallocated acreage in ind. est.			.52	.36
41. Acreage of F.T.Z				.83
42. % allocated acreage of F.T.Z.	.66			.33
43. % unallocated acreage of F.T.Z.				.84
44. Pioneer status	.94			
45. Industry with LUR	.72			

Note: Only loading $\pm \geq 0.32$ are shown.

The matrix of component loadings aids in the identification of the new components.

Component I picks out high per capita income substantiated by proxy income variables such as cars per thousand population and electricity consumption per head in urban areas. These variables are related to towns of over 100,000 population size, concentration of banks, diversified sectoral structure (with emphasis on manufacturing, construction activity and transport and communication services) and a large district population in 1970. The growth summarised by these variables has been aided by an overt concentration of industrial incentives in the form of loan financing, creation of industrial estates and free trade zones and tax incentives (in the form of pioneer status). The variable, denoting a rapid change in Malay population through migration also loads on this component.

This component consists of nineteen primary indicators which summarise economic advancement, urbanization, diversified employment structure, industrial assistance and a Malay population in-migration.

Component II highlights differences in income and social amenities associated with ethnic-occupational structure. Fourteen variables load highly on this component and it accounts for 9.4 per cent of the variability in the data. High incomes (GDP) and social amenities (in the form of piped water, electricity, good housing) are correlated with Chinese and to a lesser extent Indian population (immigrant population) employed in non-agricultural occupations, mainly services and utilities and living in urban

centres of 20,000 to 50,000 population size. On the contrary, Malay population with predominant pre-occupation with traditional agriculture in rural areas is negatively correlated with high incomes, social amenities and smaller medium size towns.

Component III incorporates small and medium size towns (population: 10,000 to 20,000 and 50,000 to 100,000) which are related to specialization in commerce and construction activity. These towns constitute the bulk of the urban population of the respective districts in 1957 and 1970 and the bulk of the State urban population in 1970. They are also associated with rapid urban growth in the inter-censal period (1957 to 1970). High density of domestic telephone lines is noted in these towns. Industrial estates located in these areas reflect a higher percentage of unallocated acreage. This component also emphasises the sparcity of rural population. This component extracts 6.8 per cent of the variance in the data.

Component IV represents the creation of manufacturing-based new towns with the setting up of industrial estates and free trade zones. Their location is in areas where commercial agriculture is poorly developed. The industrial sites are as yet not fully occupied. This component explains 5 per cent of the variance in the data.

Using the component scores of each of the four components, the relative positions of the districts on these four dimensions of industrial policy and socio-economic structure are shown on Figures 7.2 to 7.5.

Figure 7.2 shows the relative importance of districts on Component I: urban and economic advancement aided by industrial policy. Twenty-two districts have positive scores on this component; of these fourteen districts have very low positive scores (below 0.25) compared with the other eight. High scores, as expected, tend to coincide with the Klang Valley, Johore Bahru, Kinta, Butterworth and Bukit Mertajam. In these districts industrial policy measures have succeeded in diversifying the economy and the employment structure because they have been introduced in areas of high incomes, well-developed infra-structure, either within large urban concentrations or at close proximity to them. The only exception is Port Dickson where localization of the petroleum refining industry has been a major factor leading to industrial concentration and high incomes.

Figure 7.3 outlines the spatial dichotomy along lines of ethnic distribution and ethnic-occupational specialization. Thirty-one districts have negative scores on this component. Negative scores coincide with the districts in the north-west, north-east and most parts of the east coast (except Kuantan, Mersing and Kota Tinggi). These districts reflect concentrations of Malay population. They are rural in character and agriculture is the main occupation. In the west coast where similar characteristics exist, negative score are recorded. Krian, Sabak Bernam, Rembau, Batu Pahat and Pontian are examples.

Districts with positive scores are mainly in the west coast. These districts are predominantly Chinese with

Fig: 7.2 COMPONENT SCORES — COMPONENT I

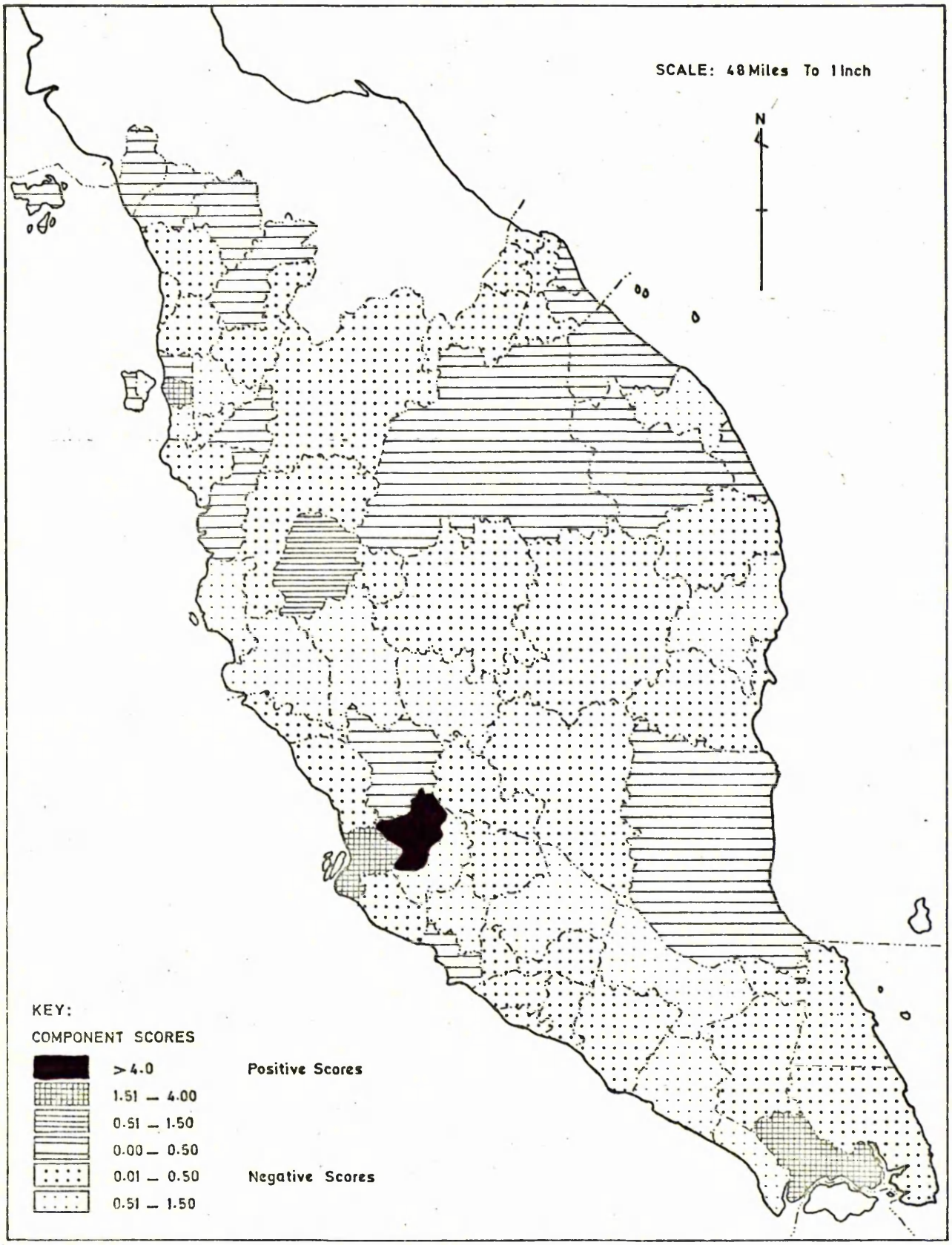
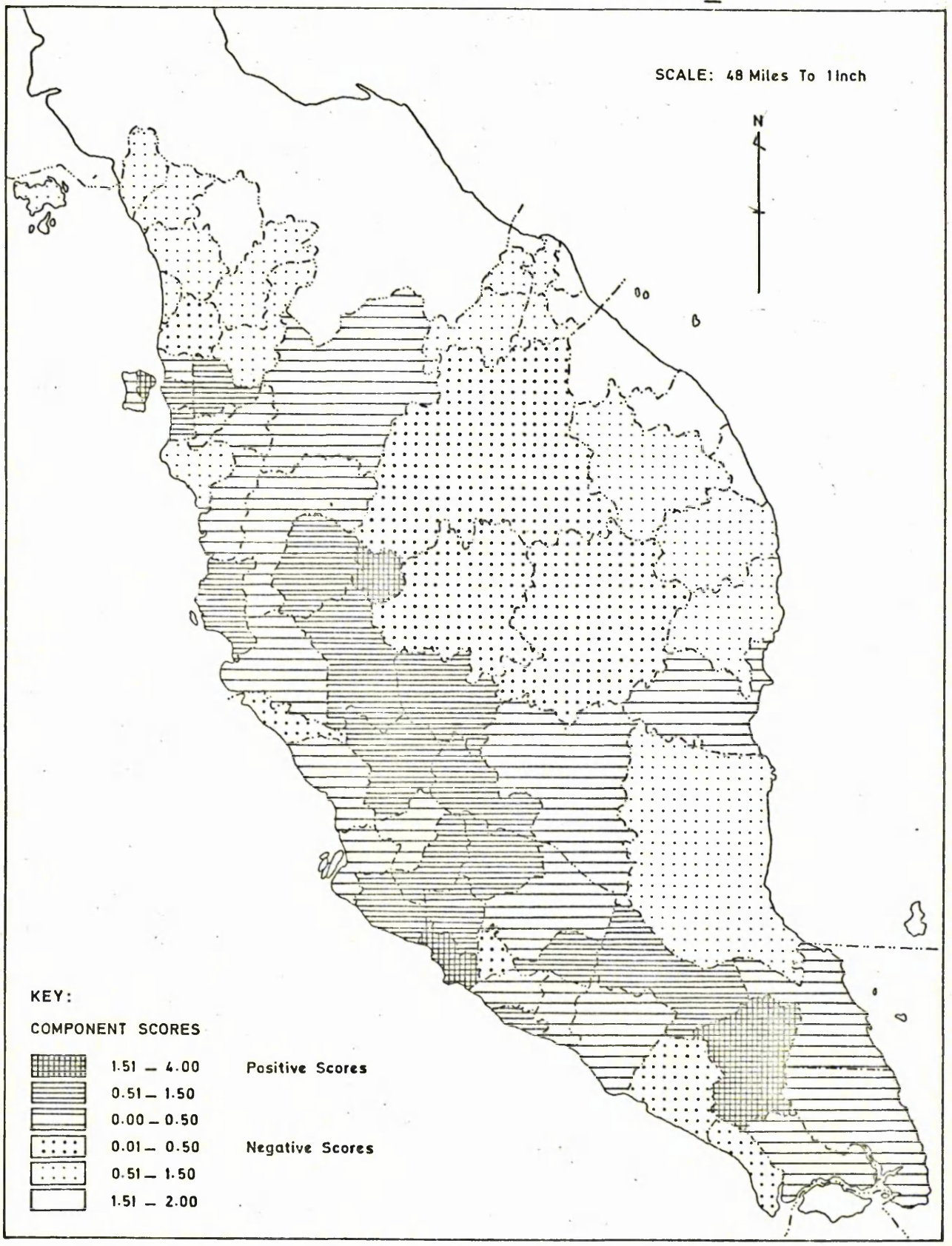


Fig: 7.3 COMPONENT SCORES — COMPONENT II



higher incomes and better developed social amenities. Extreme concentrations of Chinese population with higher income are indicated by very high scores in Penang north-east, Port Dickson, Cameron Highlands and Kluang.

Districts' component scores on Component III are shown in Figure 7.4. High scores are recorded in Kota Bahru, Kuala Trengganu, Kuantan, Penang north-east, Kota Star, Kuala Lumpur, Seremban and Malacca Central. These are districts with State capitals and the concentration of the State urban population.

In the States of Penang, Perak and Johore moderate positive scores are recorded by districts outside the districts with the State capitals. This pattern reflects a balanced regional hierarchy of medium and small sized towns in these three States. In the other States especially, Selangor, Malacca, Negri Sembilan and Kelantan primacy patterns of urban development are evident from the low scores of districts apart from the districts with the respective State capitals.

Figure 7.5 depicts the pattern of scores on Component IV: the development of industrial estates which are not yet occupied. High positive scores are recorded in Klang, Bukit Mertajam, Johore Bahru, Penang south-west, Kemaman and Malacca Central. Other districts with positive scores include Perlis, Kubang Pasu, Kuala Muda, Pontian, Pekan, Marang and three districts in Kelantan. This component shows that industrial sites exist in a very wide range of socio-economic conditions. These sites compete with each other on a national scale for industrial projects.

Fig: 7.4 COMPONENT SCORES — COMPONENT III

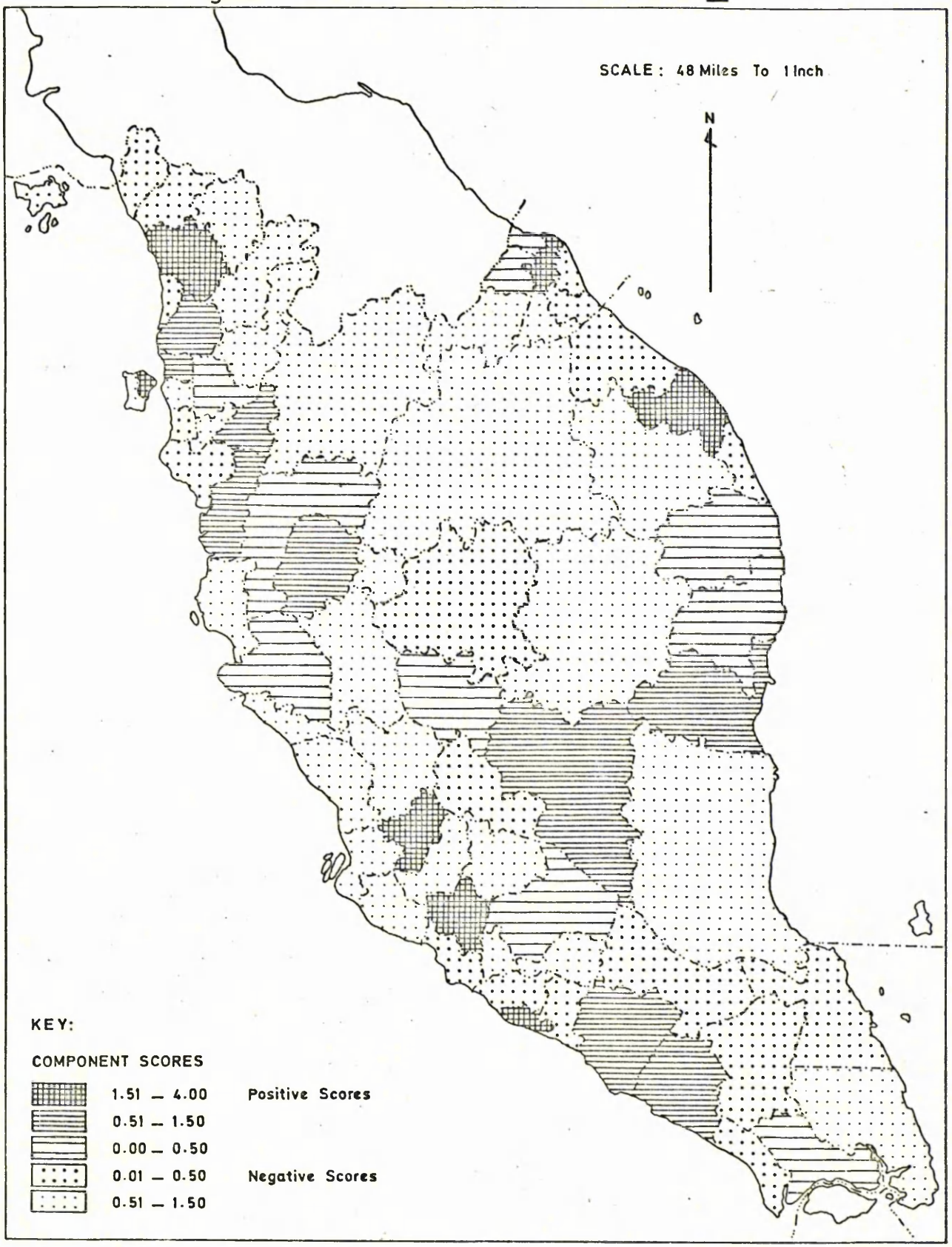
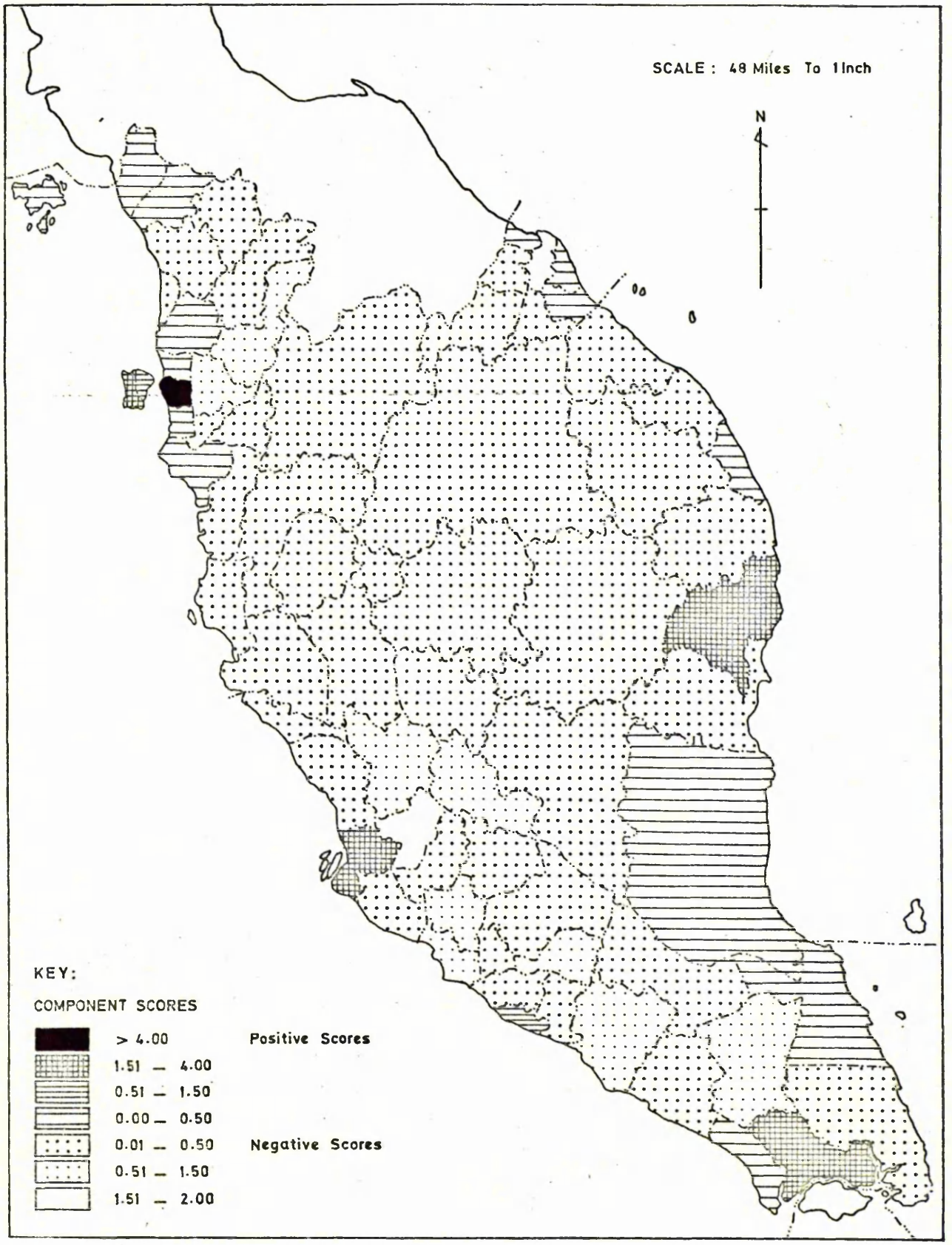


Fig:7.5 COMPONENT SCORES — COMPONENT IV



This component depicts, spatially, the attempt by industrial planners to ignore socio-economic differences in an attempt to decentralise the location of manufacturing industry.

7.6 Regionalization on the basis of Socio-Economic and Industrial Policy Components

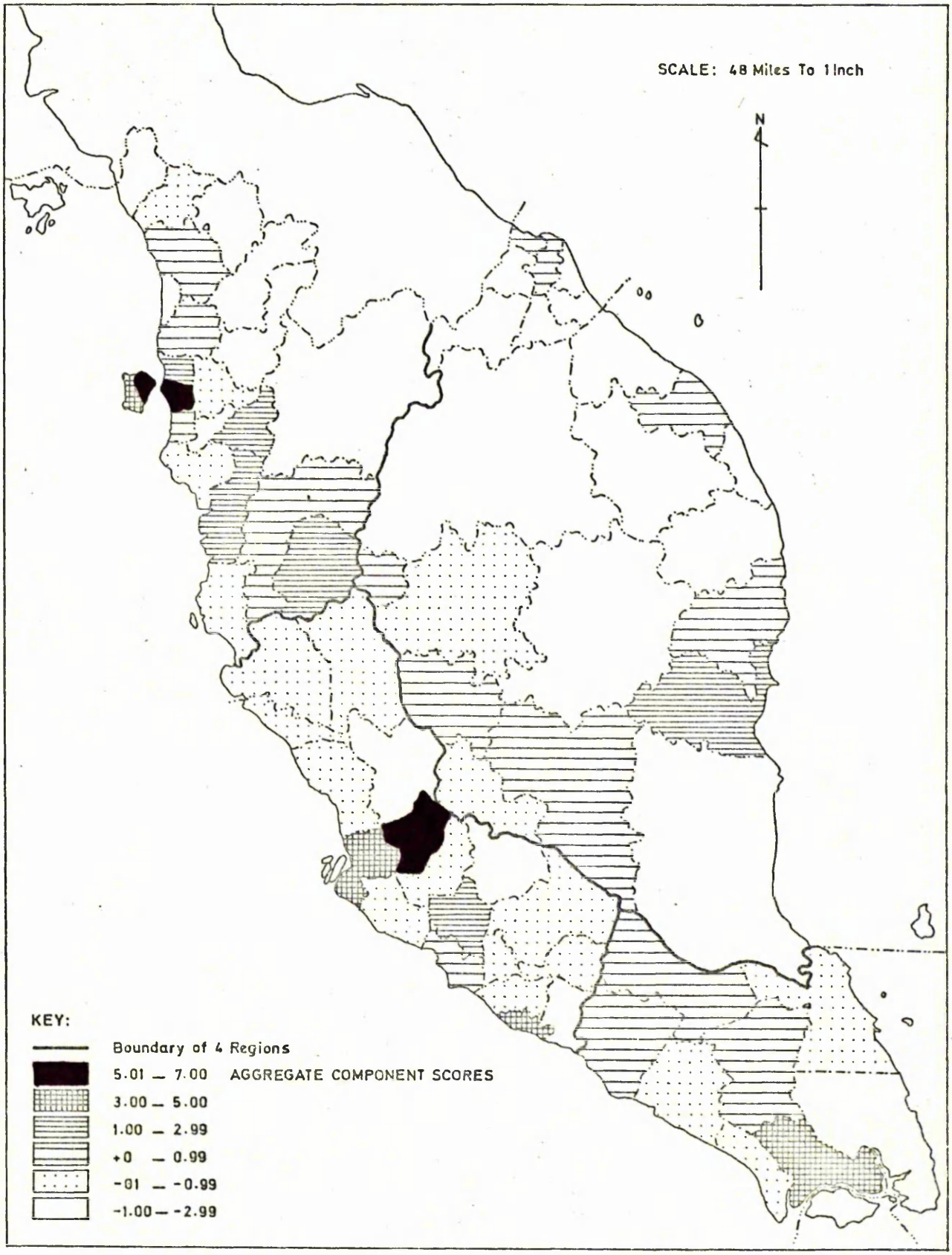
The four orthogonal components are four discriminating dimensions of industrial policy and socio-economic structure. The component scores on the four components for each district can thus be summed up to give an aggregate score that could provide a numerical index by which the districts could be classified into a hierarchy based on Government assistance (industrial policy) and socio-economic structure. Figure 7.6 depicts the six major groups into which the districts can be classified on the basis of the aggregate scores.

The highest score, not unexpectedly, is recorded by Kuala Lumpur district, followed by Penang north-east and Bukit Mertajam districts. These three districts belong to the first group. In the second group are the four districts of Klang, Johore Bahru, Penang south-west and Malacca central. Kuantan, Larut/Matang, Seremban, Butterworth and Kinta[1] districts constitute the third group.

---

1. The slightly lower score of the Kinta district can be attributed to the omission of the mining component since only two-thirds of the variance in the data has been extracted by the four components.

Fig: 7.6 REGIONALIZATION ON THE BASIS OF AGGREGATE SCORES ON FOUR COMPONENTS OF SOCIO-ECONOMIC STRUCTURE AND INDUSTRIAL POLICY



Each of the twelve districts mentioned above have aggregate scores of one and above placing them in a relatively separate category from the remaining 58 districts.[1]

The fourth group also records positive scores. The group contains fifteen districts which are widely dispersed. Of these, five districts are in the east coast and two of these districts have State capitals (Kuala Trengganu and Kota Bahru). The fifth group consists of nineteen districts. The last category, which is the largest group has twenty four districts located mainly in Kedah, Kelantan and Trengganu. It also includes two districts of Pahang and one district from each of the west-coast states.

---

1. It is interesting to note that a Q-mode component analysis by districts on the 45 socio-economic and industrial policy indicators as characteristics, with the aim of grouping the districts into Government-assisted socio-economic regions, produced only two major components. The first component consisted of the 12 districts that are grouped above into the first three groups based on the aggregate scores of four components of the R-mode component analysis. The remaining 58 districts formed the second component. As the loading of the individual districts on the first component were all 0.99, it was difficult to identify sub-groups on the basis of correlation coefficients.

   In order to find out if removal of the districts in the first component could lead to the identification of sub-groups within the second component of 58 districts, the component analysis procedure was repeated on 58 cases (districts in component two). Even so, only one component emerged, with all 58 districts in it. The aggregate scores of the four components of the R-mode analysis, have enabled sub-division into three groups on a descending scale. This imples that although, strictly speaking, the aggregate scores reflect a loss of information by not taking the remaining components into consideration, they are a more precise set of discriminating dimensions than the forty-five primary variables.

If the country is divided into four loosely defined regions with the northern region extending to as far south as Kinta and the Dindings, the Central region comprising of the districts of Lower Perak, Selangor, Negri Sembilan and Malacca, the southern region consisting of the districts of Johore and the eastern region containing the districts of Pahang, Kelantan and Trengganu, then, each district's aggregate score (on industrial assistance and socio-economic structure) can be compared regionally. The regional hierarchy on the basis of Government's industrial assistance and socio-economic structure is given in Table 7.5.

The regional pattern reflects great diversity between and within regions. An overall high ranking pattern of districts on the above scale does not exist in any region. In fact in the acclaimed affluent central region fourteen of the nineteen districts belong to the fifth and sixth groups (the highest percentage compared with other regions). This feature reflects a 'primacy' pattern of development in the central region.

The northern region, among the four, reflects a more diversified development, spatially. Three districts in the first two groups are followed by another three districts in the third group.

In the southern region, no district has achieved Group one status. With the absence of districts in group three and with only Johore Bahru in group two, the pattern fails to provide a hierarchy. Six of the eight districts are clustered in groups four and five. The "growth pole"

Table 7.5 REGIONAL HIERARCHY OF DISTRICTS BASED ON SOCIO-ECONOMIC CHARACTERISTICS AIDED BY INDUSTRIAL POLICY MEASURES

Grouping based on Aggregate Scores of 4 Components	Northern Region		Central Region		Southern Region		Eastern Region	
	No.	%	No.	%	No.	%	No.	%
I	2	9.1	1	5.3	-		-	
II	1	4.5	2	10.5	1	12.5	-	
III	3	13.6	1	5.3	-		1	4.8
IV	4	18.2	1	5.3	3	37.5	7	33.3
V	4	18.2	11	57.9	3	37.5	1	4.8
VI	8	36.4	3	15.7	1	12.5	12	57.1
Total	22	100.0	19	100.0	8	100.0	21	100.0

impact of Johore Bahru district on the region is low.

In the eastern region the differences between the top ranking and lower order districts is less marked because no district belongs to the first two groups. The potential of Kuantan district as a regional "centre" is obvious with seven districts in a slightly lower position on the socio-economic scale.

The implications of this pattern for the planning of development in West Malaysia are extremely complex and seem to emphasise the need for spatially co-ordinated planning procedures rather than planning on an ad hoc or state basis.

The pattern confirms the wide range that exists between districts on the basis of socio-economic structure. It is evident that industrial assistance based on existing policy measures is unlikely to bridge the gap between the twelve districts in the first three groups and the forty-three districts in the last two groups. On the contrary, industrial policy has been instrumental in placing the twelve leading districts very high on this scale.

How do these four components relate to the level of manufacturing achieved by the districts in 1970? Two techniques are applied to find out if relationships exist between the district's manufacturing sector and its socio-economic structure and acquired industrial assistance. First, a canonical correlation is applied between the four manufacturing components (derived in chapter 6) and the four socio-economic-industrial assistance components. Secondly, a multiple-regression of the four socio-economic

industrial assistance components on the level of manufacturing (Component I of the analysis on manufacturing indicators) is carried out, not as a predictive technique but to obtain the multiple correlations that could explain the relationships.

7.7 Canonical correlation between Manufacturing and Industrial Policy and Socio-economic Components

Canonical correlation analysis is a multivariate statistical technique which studies the interrelationships between two sets of measurements made on conceptually related samples of subjects. It is chosen for the analysis below because it is the only technique that deals satisfactorily with the situation in which the dependent variable is represented by a data set rather than a single variable. Thus, it is a technique which takes as its basic input two sets of variables.

The basic strategy of the canonical correlation analysis is to derive a linear combination from each of the sets of variables in such a way that the correlation between the two linear combinations is maximised.[1] A pair of the linear combinations is referred to as a canonical variate and a canonical variate is essentially equivalent to one of the principal components produced by the principal component analysis. The only difference is that in canonical

---

1. Coley, W. and Lohnes, R. 'Multivariate Data Analysis', John Wiley and Sons, Inc., 1971. P. 169 and 170.

correlation the linear combinations of the original variables are produced not with the intention of accounting for as much variance as possible within one set of variables but with the aim of accounting for a maximum correlation between the two sets of variables.

After the first canonical variate has been extracted, additional ones may be calculated from the residual variance, that is, their linear functions must be uncorrelated with the first one. Thus each pair of variates derived from the maximally correlated pair of linear-functions is orthogonal or independent.[1]

The procedure operates on a matrix of $R = (R_{11}, R_{12}, R_{21}, R_{22})$ of interrelationships among the variables of the two sets.[2]

The amount of correlation between each pair of canonical variates is the canonical correlation between them and the eigen value represents the amount of variance in one canonical variate that is accounted for by the other canonical variate.[3]

As the canonical correlation analysis and the principal component analysis are analogous, interpretation of canonical variates are carried out in the same manner as the components in principal component analysis. Sets of canonical variate scores are provided as the statistical output dependent on the number of variates extracted. These can be used, in this analysis, to obtain regional patterns

---

1. Coley, W. and Lohnes, R., Op.cit., P. 169.
2. Ibid., P. 168.
3. S.P.S.S. Manual, Op.cit., P. 516-518.

of associations between manufacturing activity and socio-economic characteristics assisted by industrial policy.

Stewart and Love (1968) and Miller (1969) have developed a new analytic tool in addition to the canonical correlation coefficient.[1] It is known as a Redundancy Measure. This involves interpretation of the canonical factors of the two sets. The proportion of variance extracted from the first data set by a canonical factor can be calculated and the redundancy measure indicates the proportion of variance extracted by the factor multiplied by the shared variance between the factor and the corresponding canonical factor in the other data set. The redundancy measures thus express "the actual overlap between the two data sets that is extracted in the first canonical relationship as seen from one set when the other set is already available."[2] The redundancy measure is a supplementary test to the significance of the high canonical correlation.

The canonical correlation analysis of manufacturing and socio-economic components produced two variates. The first variate shows that the first canonical factors are related by a coefficient of 0.96. This variate accounts for 91 per cent of the variance in the eight components of the two sets. The second variate shows a correlation coefficient of 0.52 between manufacturing and socio-economic and policy components based on the residual variance. It extracts only 27 per cent of the residual variance. The second variate

---

1. Coley, W. and Lohnes, R. Op.cit., p. 170.

2. Ibid., P. 170-172.

is also significant at the 99 per cent probability level although it is less dominant than the first variate.

The redundancy measure shows that the explanatory power of the first variate is high (23% of the first set given the second set and vice-versa). But the total redundancy indicates that the explanatory power of the socio-economic structure combined with industrial assistance (policy measures) on manufacturing activity is higher than the impact of manufacturing on the socio-economic structure. The test also confirms that while economic structure is the causal factor in the location of manufacturing and the level of manufacturing attained, the relationship is dual in character since manufacturing influences the socio-economic structure, considerably.

The percentage of variance extracted by each of the variates in the respective data sets is high (Table 7.6) although in both variates, one variable of each set tends to correlate highly with only one variable of the second set to produce the interrelationships. These variables are indicated by asterisks in Table 7.6.

The two variates describe two significant relationships between the manufacturing sector and the socio-economic structure assisted by industrial policy measures.

The two relationships show:-

1) That the level of manufacturing is highly correlated with areas of economic advancement, urbanization, diversified employment structure, population in-migration, existence of banking facilities. In these areas strong industrial

Table 7.6 CANONICAL VARIATES, CANONICAL COMPONENT STRUCTURE AND REDUNDANCY MEASURES

	Canonical Variates I	Canonical Variates II	
Eigenvalues	.91	.27	
Canonical Correlation	.96	.52	
Wilk's Lambda	.06	.67	
Chi-Square	185.0	25.7	
Degrees of freedom	16.	9	
Significance	0.0	0.0	
Manufacturing Components			
V1	.98*	.17	
V2	.16	-.95*	
V3	-.04	.24	
V4	-.03	.08	
Variance Extracted of the first set	.25	.25	
Contribution to Redundancy	.23	.07	Total Redundancy of first set given to second set = .30
Socio-Economic + Policy Component			
V1	.92*	.13	
V2	.24	-.67*	
V3	.29	.20	
V4	-.05	.16	
Variance Extracted of the Second set	.25	.14	
Contribution to Redundancy	.23	.04	Total Redundancy of second set given to the first set = .27

assistance in the form of physical incentives, tax incentives and credit facilities is available.

The power of mutual explanation for each set when the other set of variables is available, is the same (23 per cent). This lends support to the conclusion that while manufacturing activity, which is the late-comer has been attracted to large urban centres which record high socio-economic well-being, the rate of industrialization has been accelerated by industrial policy measures. The growth of the manufacturing sector in return has further helped to improve the socio-economic position of these areas by diversifying the sectoral structure. This reflects the impact of economies of agglomeration.

2) That high capital intensity and productivity in the manufacturing sector is associated with districts that have medium size towns of 20,000 to 50,000 population size. These areas also record high per capita GDP, well developed social amenities and a concentration of immigrant population (Chinese and Indian) spatially and in non-agricultural occupations. The non-agricultural occupations are more important than agricultural occupations in these districts. The ability of the above mentioned socio-economic characteristics of the areas to explain the capital-intensive structure of the manufacturing sector is 7 per cent according to the contribution to redundancy of the first set when the second set is available. The impact of the structure of the manufacturing sector on the above mentioned socio-economic characteristics of the region is lower only 4 per

cent based on the contribution to redundancy of the second set when the first set is available.

The spatial pattern of these relationships will be analysed as they are highly suggestive in the context of the spatial distribution of manufacturing industry and the recent strategy of industrial development.

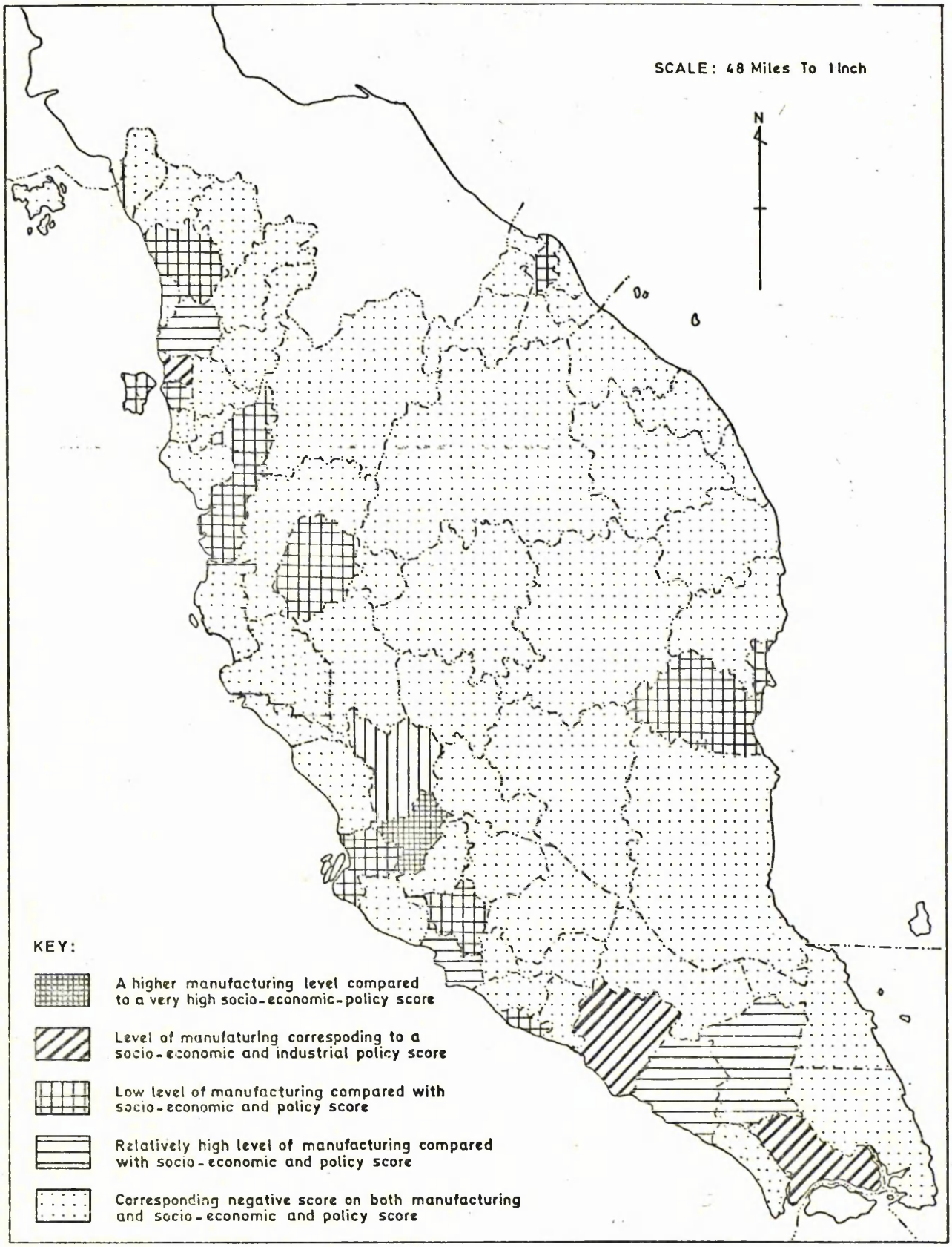
Based on the associations in canonical variate one, the seventy districts can be classified into five categories according to their scores on Canonical Variate I. The pattern of distribution is given in Figure 7.7.

The five categories are:-

1. Those districts that have a higher score on the level of manufacturing compared to a high score on the socio-economic and policy scale.
2. Those districts that have a level of manufacturing corresponding to a score on the socio-economic and policy scale.
3. Those districts that are under achievers in the manufacturing sector compared to their socio-economic and policy ranking.
4. Those districts that are slightly higher on the level of manufacturing compared to their socio-economic and policy ranking.
5. Those districts that are equally low (negative scores) on both the manufacturing and the socio-economic and policy scores.

Figure 7.7 shows that based on the above classification, fifty districts belong to the fifth category, that is, they record negative scores on both scales. They are predominantly agricultural districts.

Fig: 7.7 CLASSIFICATION OF DISTRICT ON CANONICAL VARIATE I



Four districts record relatively higher scores on the level of manufacturing compared to their scores on the socio economic and policy scale (fourth category). Of these Port Dickson and Kluang are most outstanding. In Port Dickson the localization of petroleum refining industry explains the pattern shown. But the differences between the two scores are not very marked. In Kluang the palm oil processing industry associated with commercial agriculture contributes to this anomaly. Batu Pahat and Kuala Muda are the other two districts within this category. Although the scores are generally low, these districts reflect the concentration of some labour-intensive industry in labour surplus areas.

An interesting aspect of the analysis is that twelve districts with higher scores on the socio-economic and policy scale had underachieved on the level of manufacturing in 1970. These districts are widely dispersed. Seven of them (Kuantan, Kota Bahru, Malacca Central, Seremban, Kinta, Penang North-east, and Kota Star) are districts within which State capitals are located. The Klang district also had an underachieved performance in 1970 because of the "backwash" effects of Kuala Lumpur district on it. Ulu Selangor, Larut/Matang, Bukit Mertajam and Penang S.W. also belong to this category.

Only three districts Johore Bahru, Muar and Butterworth had levels of manufacturing comparable to their socio-economic positions. In Johore Bahru and Butterworth the setting up of industrial estates facilitated development.

In Kuala Lumpur, the score of 7.2 on the level of manufacturing exceeds the score of 6.5 on the socio-economic

and policy scale reflecting a high concentration of manufacturing industry in the national capital which is also the largest urban centre in the country.

The pattern of associations indicated by Canonical Variate II show a lower degree of overlap of the two sets of components, spatially. Only in seven districts are the canonical variate scores of the first set related to the second set. These show a spatial coexistence of capital intensive manufacturing sector and concentration of immigrant populations in urban centres of 20,000 to 50,000 population size. These districts are Bukit Mertajam, Kluang, Termeloh, Port Dickson, Ulu Selangor, Alor Gajah and Pontian. The extreme case is Port Dickson. It denotes the capital-intensity of the petroleum refining industry.

7.8 Multiple Regression Analysis

A useful supplement to, but in no way a substitute for the Canonical Correlation analysis, is provided by the Multiple Regression analysis of each of the manufacturing components regressed on all the four components of the socio-economic and industrial policy indicators.

The manufacturing components are taken as the dependent variable, one at a time and the four components of industrial policy and socio-economic structure are the independent variables.

Multiple regression is a general statistical technique through which the relationship between the dependent and the set of independent variables is derived. The results are given in Table 7.7.

A Multiple Regression of the level of manufacturing on the four socio-economic and policy components indicates that 89 per cent of the variance in the level of manufacturing is explained by the four independent dimensions of socio-economic structure and industrial assistance. The relative contributions of the dimensions vary a great deal. The multiple correlations emphasise the importance of component one. Next in importance are components three and two.

Productivity and capital-intensity of the manufacturing sector (Component II of manufacturing) are less strongly explained by the four socio-economic components. Only 16 per cent of the variance in the data is contributed by the four components. Of these only the first two components are significant at the 95 per cent probability level.

The remaining two manufacturing components (Component III and Component IV) are not significantly related to socio-economic and industrial policy dimensions as shown in equations 3 and 4 in Table 7.7.

7.9 The Implications of the Findings

The component analysis of forty-five socio-economic and industrial policy variables and the canonical correlation between the four manufacturing components and the four components of industrial policy and socio-economic structure confirms the complementary role that industrial policy plays as a locational factor if combined with the appropriate socio-economic structure.

Table 7.7. MULTIPLE REGRESSION: RELATIONSHIP BETWEEN SOCIO-ECONOMIC AND POLICY COMPONENTS AND EACH OF THE MANUFACTURING COMPONENTS

1. $Y_1 = +0.00 + 0.88 X_1 + 0.17 X_2 + 0.29 X_3 + -0.04 X_4$

   $F = 461 \quad F = 17 \quad F = 50.8 \quad F = 0.9$

   $r^2 = 0.89$

2. $Y_2 = -0.00 + -0.21 X_1 + 0.29 X_2 + -0.08 X_3 + 0.15 X_4$

   $F = 6.5 \quad F = 12 \quad F = 1.0 \quad F = 3.4$

   $r^2 = 0.16$

3. $Y_3 = +0.00 + 0.01 X_1 + -0.05 X_2 + -0.12 X_3 + 0.5 X_4$

   $F = 0.01 \quad F = 0.22 \quad F = 1.1 \quad F = 0.17$

   $r^2 = 0.02$

4. $Y_4 = +0.00 + -0.08 X_1 + -0.09 X_2 + -0.3 X_3 + 0.00 X_4$

   $F = 0.44 \quad F = 0.57 \quad F = 0.07 \quad F = 0.00$

   $r^2 = 0.01$

($F = \geqslant \pm 7.08$) significant at 99% probability level.

($F = \geqslant \pm 4.00$) significant at 95% probability level.

Dependent Variables

Y_1 : Level of Manufacturing Component I

Y_2 : Manufacturing productivity & Capital Intensity Component II

Y_3 : Change in productivity of capital in the manufacturing sector 1968-1970 Component III

Y_4 : Change in the productivity of manufacturing units 1968-1970 Component IV

Independent Variables

X_1 : urbanization, economic advancement diversified sectoral structure and industrial assistance. (Component one)

X_2 : Immigrant ethnic - occupational structure in lower medium size towns with good social amenities and high incomes (Component two)

X_3 : Small & medium size towns with commerce & construction activity. (Component three)

X_4 : Creation of new towns based on industrial estates and F.T.Z.'s (Component four)

While the impact of industrialization on the district's economy is real, statistical analysis suggests that manufacturing industry's effective contribution rests on the locational attractiveness of the district. This in turn, is determined by inter-related socio-economic characteristics. Among them are the influence of large urban centres, a diversified sectoral structure with a non-agricultural bias, relatively high incomes and well-developed financial institutions. When some of the above socio-economic conditions exist, economic attractiveness can be enhanced by elements of industrial policy such as physical infra-structural and fiscal incentives.

These findings also confirm the close association or co-existence of urbanization and industrialization in West Malaysia, a phenomenon indicated in many developed and developing countries. But it has to be stressed here, that while the urban structure may induce the process of industrial growth and development, the study, strongly suggests that a mere urban settlement of some size alone, does not necessarily lead, spontaneously, to a diversified employment structure.[1]

---

1. This conclusion seems to support some of the findings and suggestions in the Pahang Tenggara study, which states,

   "It would appear then that if the settlement size is attained that the desired occupational structure is automatic..... this is not the case since the settlement size is itself dependent on the induced employment activities."

   Pahang Tenggara Regional Master planning study: Settlements and Infrastructure, Kuala Lumpur, 1972, P.113.

This discussion also draws attention to the Pahang Tenggara report's suggestion that "the focal point of the success or failure of the urban strategy is the manufacturing sector.".[1] This statement is unacceptable based on the findings of this analysis. A religious pursuit of the strategy of industrial diversification through the creation of new towns based on industrial estates and free trade zones without the restructuring of the sectoral structure and the socio-economic environment of the regions in which these towns are located, is unlikely to produce effective results.

The pattern of regional economies, constructed on the basis of the aggregate scores of the four major components highlight the fact that some districts were under-achievers in 1970 in terms of the level of manufacturing they had achieved. The merit of these findings would imply that if substantial industrial sites are provided in these districts, then manufacturing industry may disperse itself into these districts in the next decade.

The distribution of projects approved in the 1970 to mid 1974 period certainly supports the results of this analysis. The impact of socio-economic forces on industrial location can be inferred from the knowledge that a substantial number of approved projects had opted for sites in districts which have been termed "underachievers".

In areas depicting negative scores on both scales - manufacturing and socio-economic - a systematic planning of economic and social development seems to be the answer to

---

1. Ibid., P. 113.

the achievement of a socially desirable programme,[1] rather than an overt stress on industrialization to overcome regional disparities.

Just as a policy of providing industrial incentives proves to be effective in regions which score relatively highly on the socio-economic scale, the need for disincentives to prevent polarization of industry in the well-endowed districts (compared to the rest) may be necessary. Reference here is made to Kuala Lumpur district which shows that its score on the level of manufacturing has surpassed its score on the socio-economic scale. To facilitate industrial decentralization, a policy of disincentives in sections of Kuala Lumpur could function in the same way as incentives in regions which have underachieved in manufacturing, relative to their socio-economic structure. An appropriately timed policy of disincentives could also avoid the problems associated with diseconomies of over-concentration.[2]

Hence the preceding disucssion confirms that minimising of socio-economic differences is an important pre-condition for achieving industrial decentralization. To verify the importance of socio-economic structure on industrial location, spatial patterns of commodity flows

---

1. Nelson, J. and Tweeten, L., 'Systems Planning of Economic Development in Eastern Oklahoma'. American Journal of Agricultural Economics, Vol. 57, No. 3, Aug. 1975, P.480.

2. The contrary view that diseconomies of concentration will automatically lead to dispersal is not popular even in the industrialised countries. See: Chisholm, M., 'Freight transport costs, industrial location and regional development' in Chisholm, M. and Manners, G. (Eds) Spatial Policy problems of the British economy, Cambridge University Press, 1971, P. 214.

will be dealt with in the next chapter. Commodity flows as a form of spatial interactions reflect functional interactions which are based on the static structural patterns outlined in this chapter.

CHAPTER VIII

PATTERNS OF INTERACTING REGIONS

In the previous chapters an analysis of the pattern of regional economies as factors explaining the spatial pattern of manufacturing activity was attempted. But Hartshorne, approving Hettner's argument states, "No phenomenon on the earth surface may be considered for itself, it is understandable only through the application of its location with reference to other places on the earth."[1] Based on this concept, more than the static description of facilities and regions ventured into so far, are the patterns of regional interactions.

The processes of production, consumption and economic growth are accompanied by numerous acts of exchange and movement between the units involved in the processes.[2] Interregional patterns of flows of objects of exchange, highlight the functional interdependence of regional economies by delineating hinterlands or markets for known sets of production points. They could thus clarify the complexities of individual regional economic structures[3] more explicitly than static structural indicators.

---

1. Hartshorne, R., The Nature of Geography, Lancaster, 1939, P. 283.

2. Wojciech Morawski, Balances of interregional commodity flows in Poland: A value Approach in Regional Science Association Paper Vol. 20, Hague Congress 1967, reprinted in Blunder, J.; Brook, C.; Edge, G.; Hay, A., Regional Analysis and Development, The Open University Press, 1973. P. 66.

3. Michael E. Eliot Hurst (Ed.), 'Flow Analysis', Transport Geography - Comments and Readings, Mcgraw-Hill Series, 1974, Part Three, P. 129.

The objects of exchange can be identified as material goods or commodities consisting of raw materials, semi-finished goods and finished goods; services which involve movements of skilled personnel; money flows such as movement of capital; communications involving information flows, and movement of people.

8.1 Inter-Regional Commodity Flows

From this very large variety of objects of exchange, the movement of a selected number of commodities have been chosen for this study to delineate interacting regions. The selection of the commodities is, first and foremost, restricted by the range of commodities for which data are available from the Origin-Destination Surveys of 1971 to 1974 conducted by the Highway Planning unit of the Ministry of Transport, West Malaysia. Secondly, the choice of thirty-nine commodities from those listed in the surveys is based on the rationale that commodities are relevant to the theme of the current research. They are either manufactured goods or raw materials. The study of the spatial patterns of commodity flows (manufactured goods or raw materials) are intended to lead to the identification of the locational characteristics of the points of origin of manufactured goods as points of production and points of destination as markets for these products in relation to raw material supplies. The magnitude and structure of the flows could help identify the spatial extent and major market areas served by different known production origins.

Zones of influence determined by commodity flows reflect the costs of distance as well as supply and demand considerations. The theoretical concepts associated with the supply and demand conditions of manufacturing industry need to be clearly understood as a framework[1] for the analysis. Only then can the importance of distance be assessed.

On the supply side, the selection of the site for the manufacturing plant is the main problem confronting the firm. This brings us to the fundamentals of industrial location theory discussed in Chapter One. Industries vary, of course, in their locational requirements both in respect to processing costs and to transfer (transport) costs.[2] The optimum location is defined as the point that yields the maximum profits. However, complications are introduced by the fact that the location of the plant is interdependent with decisions about the location of sales, whether these decisions about the location of sales are taken by the firm itself, or by its customers or potential customers. Another variable is introduced by the fact that firms may engage in a variety of price strategies, either as alternatives to locational strategies or simultaneously.[3]

Based on these theoretical considerations and from the empirical knowledge of investors' motives in West Malaysia, the manufacturing firms are viewed as seeking to

---

1. Sections of framework for analysis has been adopted from Chisholm, M. and O'Sullivan, P., 'Freight Flows and Spatial Aspects of the British Economy', Cambridge University Press, 1973, p. 6-7.
2. Hoover, E.M., 'Location of Economic Activity', McGraw-Hill Book Co., New York, 1968, Pp. 27-41.
3. Isard, W., 'Location and Space Economy', The M.I.T. Press, 1956, P. 158-180.

achieve the most satisfactory level of profits. Hence, on the supply side of the business, they are anxious to minimise costs of operations which include processing costs, cost of assembling materials and distribution costs.

This proposition leads to the view that firms seek locations that minimise the total costs of transport incurred in their operations. Since it is generally assumed that transport cost is a direct function of distance, minimising transport costs is equivalent to minimising the total distance over which the goods are moved. In other words, firms will seek to be near to their suppliers and customers. Based on these arguments, they will, thus, choose from their potential markets and potential suppliers those that are nearest.

As there are links in the production chain, all participants will have an interest in being located near each other. Another important reason is the generation of economies that are external to the individual firms.[1] External economies (urbanization economies and localization economies) arise in a variety of ways, ranging from the wide choice of potential labour to the availability of common facilities (research, price policies), infrastructural advantages and advantages of social institutions.

Industries may be classified according to whether they are oriented towards their materials or their markets. At either end of the scale the distinction is clear but

---

1. Isard, W. Op.cit., P. 172-188.

there is in fact a sizeable proportion of industries for which the term "footloose" is applied. More important in the present context, is the possibility that the sources of materials for manufacturing and the markets for the manufactured products may be more or less co-existent in space. In such a situation labels such as "market-orientation" or "material-orientated" become meaningless. Yet for a wide variety of industries the spatial coincidence of material sources and market outlets is in fact a reality.

Thus, one may suppose that firms will seek a location near to or at the centre of the space-economy where these two forces interact. In this way, there could emerge a strong tendency for productive activity to be highly concentrated in limited "central areas" leaving much of the "periphery" relatively poor and undynamic.[1]

These concepts in turn, raise the question how can one measure "central areas" or areas with potential accessibility[2] which maximise access to whole supply and or market area? Various studies, outside Malaysia have used different definitions for "potential accessibility". Colin Clark derived the term "market potential".[3] It is

---

1. Myrdal, G., 'Economic Theory and Undeveloped Regions', Gerald Duckworth and Co. Ltd., London, 1957 P. 27-30. A reformulation and refinement of this relationship between the growth centre and the surrounding area is found in the centre-periphery model developed by Friedmann, in Friedmann, J., 'Regional Development Policy: A Case Study of Venezuela', MIT Press, Cambridge, Mass. 1966.

2. Chisholm, M. and O'Sullivan, P., 'Freight Flows and Spatial Aspects of the British Economy', Cambridge University Press, 1973, p.7.

3. Market potential is defined as a summation of markets accessible to a point, divided by their distances from that point see. Harris, next page footnote I

analogous to the term 'population potential' as proposed by John Q. Stewart. Harris used the 'market potential' to gauge the spatial interaction between producers and markets of the likely flow of goods from a point to accessible regions.[1] Clark and Wilson[2] in another study used the estimates of transport costs instead of route miles. Haggett and Chorley[3] put forward methods derived from the graph theory ideas of connectivity. Chisholm and O'Sullivan[4] used population miles and employment miles as indices of general accessibility.

For purposes of comparability and consistency with the preceding chapters it is decided that in this study the regional economic well-being will be substituted for 'potential accessibility'. The choice of this definition is supported by the arguments that the level and structure of freight generated is a positive linear function of the surrogates for economic activity and socio-economic well-being.[5] If this relationship exists, then the index of regional socio-economic well-being based on a large cross-section of socio-economic measures should be an appropriate measure of 'regional accessibility' given the limitation

---

1. Harris, C.D., The market as a factor in the Localization of industry in the United States. Annals Assn. of American Geographers. Vol. 44, 1954, P. 321.

2. Clark, C., Wilson, F., and Bradley, J., Industrial Location and Economic Potential in Western Europe, Regional Science, Vol. 3, 1969, P. 197-212.

3. Haggett, P. and Chorley, R., Network Analysis in Geography Edward Arnolds (Publishers) Ltd., 1969, P. 35-51.

4. Chisholm, M. and O'Sullivan, P., Op.cit., P. 19.

5. Wojciech, Morawski, Op.cit., P. 66.

imposed by the lack of data on transport cost differentials for different commodities.[1]

Based on the theoretical concepts of the supply, demand and distance factors, the following a priori hypotheses can be generated:

1. If there are significant differences in the locational advantages for firms in different parts of West Malaysia, then locations chosen should give rise to distinct patterns of commodity flows. The comparative advantages of the sites selected can be adduced from the intensity of flows, length of hauls and the extent of market or supply areas. However, all manufactured goods do not have the same threshold value, some require a larger minimum level of demand than others. If this is so, then in accordance to the growth pole[2] concept, the lower the order of goods the smaller the enterprises and the more diverse the origins or supply points and the larger the number of intraregional transactions over shorter distances. Conversely, the higher the order of manufactured goods the more restricted the supply points.

---

1. Berry, B.J.L., had attempted a similar functional interrelationship between commodity flows and structural variables in the Indian economy. Reference is made to:- Berry, B.J.L.. 'Essay on Commodity Flows and the Spatial Structure of the Indian Economy', Occasional paper, Dept. of Geography, University of Chicago, 1966.

2. The concept of growth pole originated in the work of Francois Perroux who observed that pôles de croissance (growth poles) exist as sectors within an economy. Associated with a growth pole is a propulsive industry (or firm) which is characterized by large size, a tendency to dominate others, a high degree of inter-connections with other industries or firms and relatively rapid growth. Initially the concept of the growth pole was nonspatial referring to an industry or related groups of industries. See: Perroux, F., 'Economic Space, Theory and Applications", Quarterly Journal of Economics. Vol. 64, 1950, P. 84-104.

2. The greater the economic accessibility, the larger the effective market areas of higher order goods resulting in both long and short hauls irrespective of transport costs.

3. The greater the economic accessibility of the region, the larger the volume of freight attracted and generated.

4. The greater the economic accessibility of a region the shorter the mean haul of commodity movement while peripheral areas will experience larger hauls for products generated and attracted.

5. The lower the economic accessibility, the fewer the interregional commodity flows and the more 'isolated' the region from the main stream of interaction.

6. Bulky, low value products emanate from a large number of origins and have shorter hauls consigned to their immediate market areas.

8.2 The Data for the Analysis

Data for this study are taken from the Origin-Destination Surveys conducted and compiled by the Highway Planning Unit since 1971. These surveys are conducted for certain periods of up to a week during the year, at various counting stations along major routes. Vehicular traffic are classified into commodity movements between the zones by different types of vehicles on the road and by the tonnage of commodity moved.

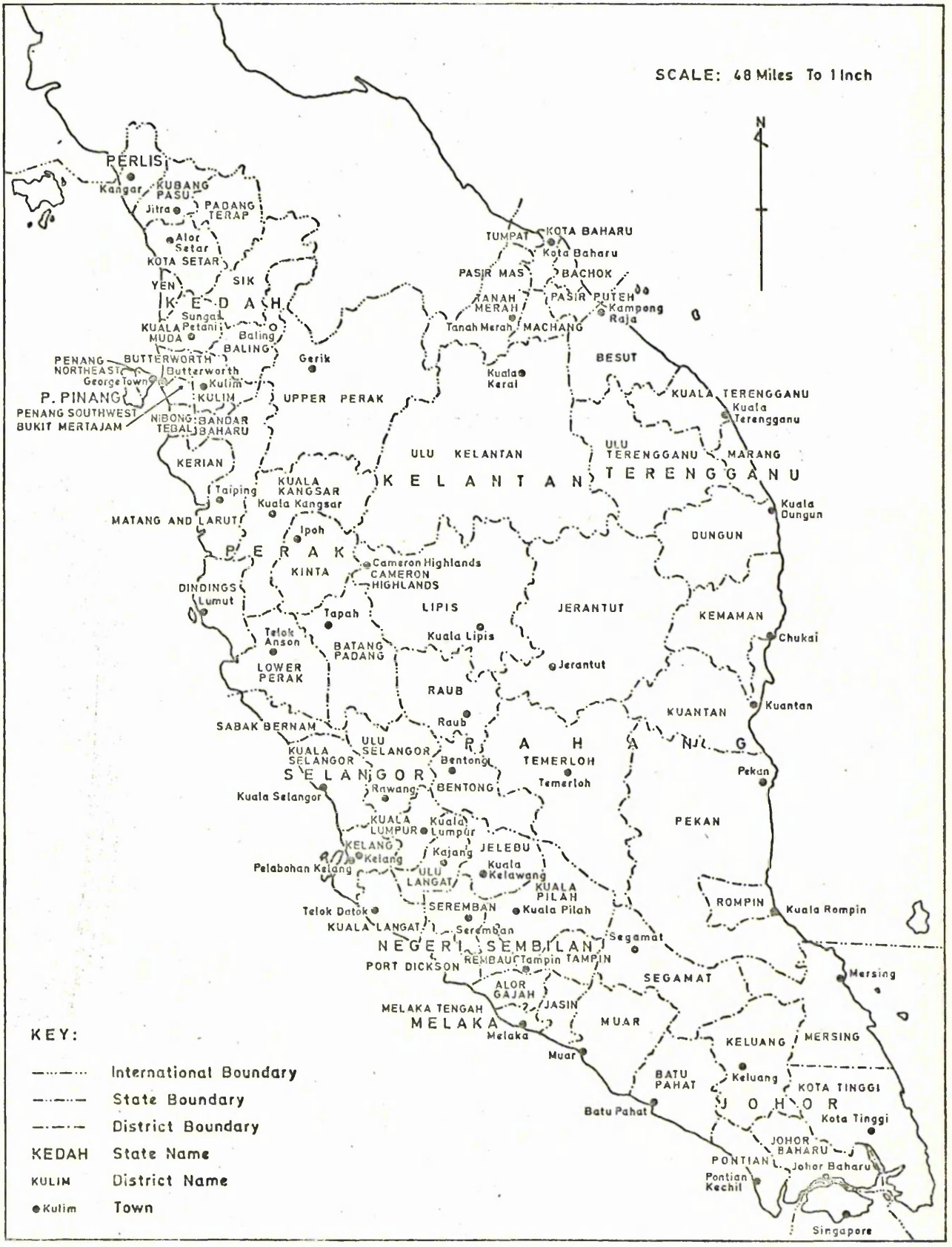
There are a total of 56 origin-destination zones, the majority of which coincide with district boundaries. An array of seventy-five commodity items are enumerated in the survey. Several new stations have been added to the set each year since 1971. The centroids and origin-destination zones are shown in Figure 8.1.

The commodity data selected for this study consist of thirty-nine different categories of goods, consisting of manufactured goods, semi-processed goods and raw materials used in the manufacturing process (mainly) land-based products). These are listed in table 8.1.

The data extracted for the years 1971 to 1974 are in the form of tonnage flows of the specified commodities for all vehicle types between and within zones stated in the origin-destination (O-D) flow matrices.

There are certain limitations imposed by the manner in which the data are collected in these surveys. The data are collected at any one station for four days in a week. Three of these are working days or week days and the fourth day is the week-end or non-working day. (Non-working days vary between States). The data are adjusted to provide the daily average flows. The surveys are not conducted at the same time at all stations within a particular year. Thus, the data are strictly not comparable nor can they be called annual averages. At best the data can be regarded as a sample in the spatial context (only a sample of enumerated stations are used in any one year). As the data are not strictly comparable it was considered appropriate to obtain a sample over time (between 1971 and

Fig:8.1 MAP SHOWING ZONES AND CENTROIDS USED AS BASIS FOR COMMODITY FLOW PATTERNS



1974). For this purpose, from the data extracted as matrices, the volume of flows are first tabulated according to the O-D dyad separately for each commodity and for each of the four years. Then, for each commodity the maximum volume of flow for any O-D pair over the 1971 to 1974 period is chosen for analysis.

The choice of the maximum volume of flows rather than the mean volume of flows as a sample over time is guided by a number of considerations. Mean values tend to be difficult to interpret and would reduce the impact of newly developed flow lines through averaging. Maximum volume of flow would incorporate additional flow lines that have developed recently and could also depict any increase in intensity of flow along the established flow pattern. Maximum volume is also the most appropriate choice as personal observations show that lorries and trailers tend to overload to economise on transport costs.

Given these data limitations the analysis on patterns of commodity flows in West Malaysia is attempted.

8.3 Principal Component Analysis

As a preliminary step, the data on the thirty-nine commodities for each of the non-zero dyad (O-D pair) is reduced using principal component analysis[1] into groups

1. The procedure adopted is based on B.J.L. Berry's technique in Essay on Commodity Flows, Op.cit., p. 191 (n^2 -n) possible pairs of centroids of zones (dyads) occupy the rows and the commodity flows occupy the columns giving an interaction matrix.

of commodities with similar flow patterns.

The possible associations between different commodity flows can be deduced from the correlation coefficients in Table 8.1. Significant relationships at the 95 per cent probability level are few reflecting the diverse nature of the commodities. Commodities such as tapioca, pineapples, sugar, coconuts and tin are highly localised resulting in diverse flow patterns. High positive correlations are seen among non-durable consumer goods such as wearing apparel, milk and milk products, footwear, paper products, tyres. Iron and steel also correlates with these commodities indicating a locational relationship of an industrial input which is important in the production process.

Construction materials is positively correlated with plywood, veneer, petroleum products, household furniture and furnishings as complementary elements in building and construction works. These items are also correlated with rubber and palm oil reflecting the bulky nature of both commodity groups and their resource-based origin. Both rubber and palm oil are export commodities, movement outwards to the ports reflect similar flow patterns.

Empty containers (tin cans and bottles) are highly correlated with consumer industry reflecting inter-industry linkage. Petroleum and petroleum products are correlated with machinery while animal feed correlate with grain, its basic raw material. Grains, in turn correlate with chemicals suggesting their use as herbicides and insecticides in the planting process.

Table 8.1. CORRELATION MATRIX OF COMMODITY FLOWS

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
1. Sugar	1.00																																						
2. Flour		1.00																																					
3. Baked Goods		0.39	1.00																																				
4. Textiles			0.39	1.00																																			
5. Wearing Apparel		0.51			1.00																																		
6. Household furniture & furnishings				0.36		1.00																																	
7. Petroleum & petroleum products						0.52	1.00																																
8. Chemicals								1.00																															
9. Fertilizer	0.44				0.42				1.00																														
10. Construction Material;						0.73				1.00																													
11. Bricks											1.00																												
12. Cement		0.33										1.00																											
13. Iron & Steel		0.57	0.38		0.51				0.37				1.00																										
14. Machinery				0.38		0.60	0.67							1.00																										
15. Plywood and Veneer						0.66				0.91					1.00																									
16. Logs																1.00																							
17. Rubber						0.53				0.61					0.68		1.00																							
18. Palm Oil						0.59				0.66				0.48	0.62		0.51	1.00																					
19. Coconuts																			1.00																				
20. Tin		0.34										0.47						0.40	1.00	1.00																			
21. Fish & Fish Products	0.34																				1.00																		
22. Animal Feed		0.38											0.45									1.00																	
23. Rice						0.36		0.79		0.37					0.36								1.00																	
24. Other Grains													0.32									0.63		1.00															
25. Salt					0.38				0.59				0.37									0.38			1.00														
26. Milk & Milk Products		0.55			0.49							0.33	0.57									0.33				1.00													
27. Beverages	0.49								0.55				0.51									0.41			0.42	0.56	1.00												
28. Canned Vegetables, fruit juices & meat			0.38										0.44									0.32				0.35		1.00											
29. Processed Foods		0.51			0.44				0.47				0.53									0.34			0.39	0.46	0.59	0.39	1.00										
30. Soap, cosmetics, medicines & drugs		0.49			0.58				0.49				0.52												0.48	0.49	0.54		0.62	1.00									
31. Tobacco, cigarettes & cigars		0.38																													1.00								
32. Footwear		0.56			0.45								0.52													0.38	0.34	0.51		0.56		1.00							
33. Paper					0.46								0.46													0.38		0.41		0.52		0.44	1.00						
34. Paper Products & Printed Material		0.62	0.33		0.57				0.37				0.54						0.35			0.40			0.35	0.59	0.49	0.52	0.51	0.54	0.46	0.54	0.64	1.00				
35. Tyres		0.52							0.35				0.43									0.42		0.33	0.35	0.44	0.44	0.41	0.53			0.39	0.51	0.56	1.00			
36. Firewood																																				1.00			
37. Empty Containers		0.61	0.37		0.52				0.47				0.59						0.33			0.38			0.41	0.47	0.52	0.42		0.52		0.47	0.51	0.57	0.53		1.00		
38. Pineapple																																						1.00	
39. Tapioca																																				0.74			1.00

NOTE. Only significant values at the 95 per cent probability level $\geq \pm 0.35$ are shown.

High correlation coefficients between paper and paper products and packaging materials is a reflection of inter-industry linkages.

Tapioca, firewood and charcoal are significantly correlated reflecting common demand patterns. These products are associated with low incomes and constitute elements of a lower standard of living.

Significant correlations between wearing apparel, soap, cosmetics, medicines, paper products and printed matter suggest demand patterns associated with urban, middle-class needs.

The correlation coefficients, in general reflect inter-industry linkages in the production processes and consumer demand patterns.

Eleven different commodity flow patterns were extracted as eleven components with eigenvalues greater than one (Table 8.2). Collectively these eleven components accounted for 68 per cent of the data variability. The commodities in each group exhibit similar flow patterns so that eleven orthogonal flow patterns were arrived at.

The eleven commodity groups, each with a distinct flow pattern can be identified from the component structure (Table 8.3) as follows:

Group I: Manufactured Consumer non-durables and Inputs

Fourteen commodities mainly foodstuffs (flour, milk and milk products, beverages, canned and processed foods), clothing, footwear, toiletries and drugs and tobacco

Table 8.2 PRINCIPAL COMPONENTS AND PERCENTAGE OF VARIANCE EXTRACTED

Principal Component	Eigenvalue	% contribution to total variability Component	Cumulative
I	9.551	24.5	24.5
II	3.959	10.2	34.7
III	2.044	5.2	39.9
IV	1.873	4.8	44.7
V	1.834	4.7	49.4
VI	1.452	3.7	53.1
VII	1.378	3.5	56.6
VIII	1.307	3.4	60.0
IX	1.132	2.9	62.9
X	1.040	2.7	65.6
XI	1.031	2.6	68.2

Table 8.3 VARIMAX ROTATED COMPONENT STRUCTURE

Variables	I	2	3	4	5	6	7	8	9	IO	II
I Sugar				0.36					0.70		
2 Flour	0.70										
3 Baked goods	0.46										
4 Textiles			0.58								
5 Wearing apparel	0.64										
6 Household furniture and furnishings		0.69	0.54								
7 Petroleum and Petroleum products			0.82								
8 Chemicals							0.97				
9 Fertilizers				0.83							
IO Construction materials		0.94									
II Bricks					0.59						
I2 Cement								0.77			
I3 Iron and steel	0.65										
I4 Machinery			0.89								
I5 Plywood and Veneer		0.95									
I6 Logs					0.60						
I7 Rubber		0.78									
I8 Palm Oil		0.7I	0.36		-0.43						
I9 Coconuts	0.35										
20 Tin								0.8I			
2I Fish									0.82		
22 Animal Feed	0.37					0.72					
23 Rice							0.88				
24 Other Grain						0.84					
25 Salt				0.68							
26 Milk and milk products	0.70										
27 Beverages	0.5I			0.55							
28 Canned Vegetables	0.64										
29 Processed Foods	0.60			0.4I							
30 Soap, cosmetics, medicines and drugs	0.69										
3I Tobacco, cigarettes, cigars	0.64										
32 Footwear	0.75										
33 Paper	0.72										
34 Paper products	0.82										
35 Tyres	0.64										
36 Firewood										0.90	
37 Empty Containers	0.66										
38 Pineapples											0.90
39 Tapioca										0.86	

Note: Only component loadings $\geq \pm$ 0.35 which are significant at the 95 per cent probability level are shown.

products loaded highly on this component. Baked beans can be included in this component although this item loaded less significantly than the rest. In addition, commodities such as iron and steel, paper and empty containers loaded on this component. These items are not used entirely by consumer public. They form part of the inputs of industrial production and as service inputs for retailing products of the consumer industry. This component explains 25 per cent of the variance in the data.

Group II: Resource-based manufactured products and semi-processed products

This group includes household furniture, construction material, plywood and veneer, rubber and palm oil. Ten per cent of the variance in the data is explained by this group of commodities.

Group III: Products of secondary industry based on imported raw materials or parts (mainly assembled products)

Commodities such as machinery, petroleum and petroleum products, textiles and furnishings loaded significantly into this component. The third component accounts for 5 per cent of the variance in the data set.

Group IV: Bulky manufactured products

These include fertilizers, beverages (alcoholic and non-alcoholic) and salt. This group explains 5 per

cent of the variability in the data.

Group V: Very Bulky resource-based products

Bricks and logs are the two items in this component which extracts a little below 5 per cent of the variance.

Group VI: Grain and grain products

Animal feed and grain loaded significantly on this component explaining 4 per cent of the variance.

Group VII: Subsistence Agriculture and Inputs

Rice and chemicals constitute this component. It extracted 3.5 per cent of the variance.

Group VIII: Commodities highly localised in the Kinta region

Tin and cement are the two commodities in this component.

Group IX: Commonly used foodstuffs

Sugar and fish constitute this component.

Group X: Commodities ubiquitously associated with lower level of living

Firewood, charcoal and tapioca loaded significantly to comprise this component.

Group XI: Commodity localised in Pontian

Pineapples as a commodity formed this component on its own.

The commodity groupings show that only the first six components are directly relevant to the manufacturing processes or as manufactured products. As such only these six groups have been selected for further analysis and the predominantly agricultural commodities (Group VII to XI) will be omitted.

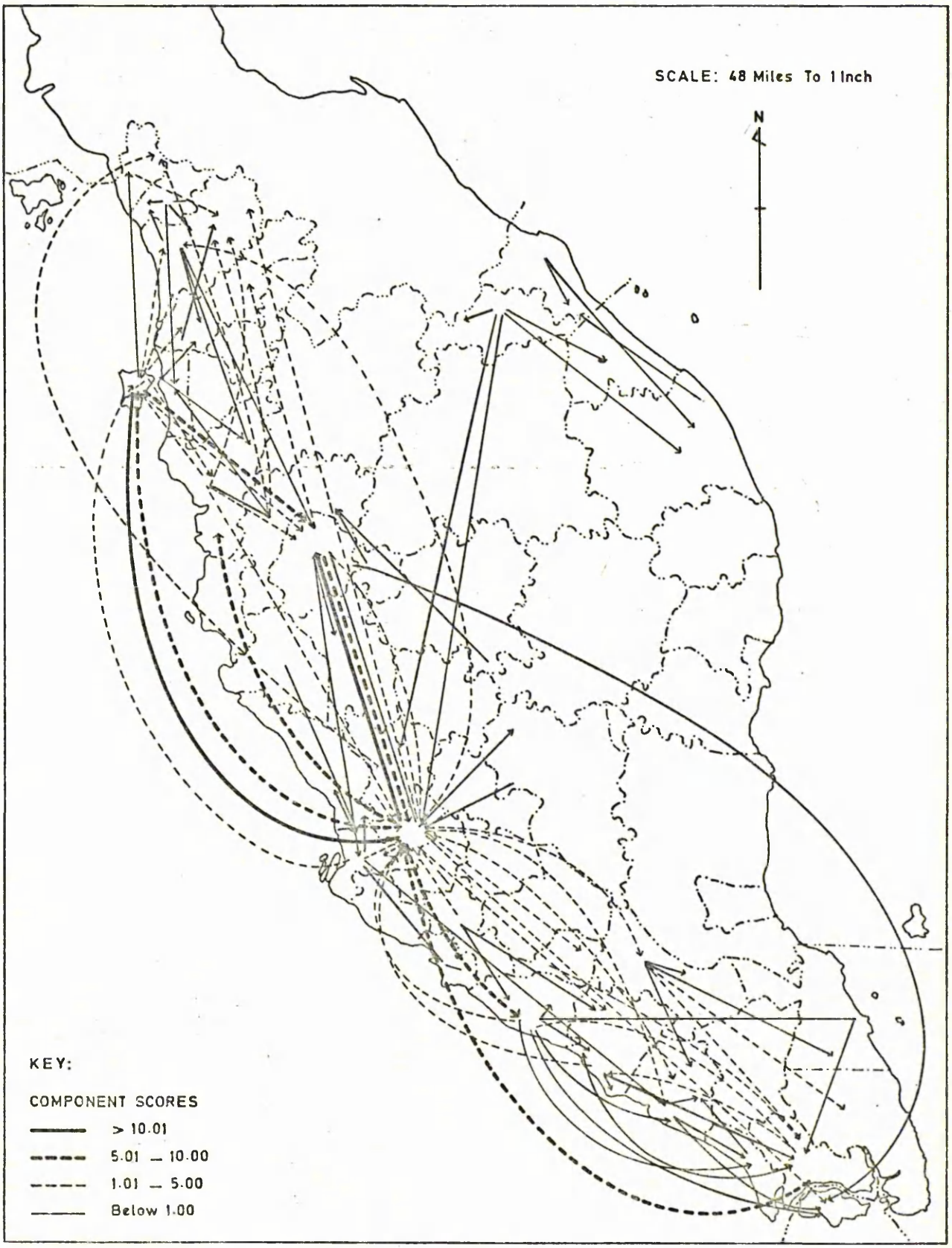
8.4 Commodity Flow Patterns

The flow patterns of the six commodity groups are shown in Figures 8.2 to 8.7. These patterns are derived from the component scores of the O-D dyads on the respective components.

Figure 8.2 shows the production centres and the extent of the markets for consumer non-durable products and inputs. It denotes the dominance of Kuala Lumpur in relation to the other major urban centres as points of origin or supply. The major markets served by the major production centres (also the major distribution centres)[1]

1. As no distinction has been made between local production and imports which are a part of this commodity movement, production centres also function as distribution centres of imported products.

Fig:8.2 THE PATTERN OF COMMODITY FLOWS – COMSUMER NON-DURABLE PRODUCTS AND INPUTS (COMPONENT I)



are shown by the magnitude of the flows along the dyads.

Kuala Lumpur is the most important production centre. Its market zone extends to Penang, Ipoh, Malacca and to a lesser extent Johore Bahru, Alor Star and Termeloh. It serves a national market from its central position in the country. Other important regional production centres are Penang, Johore Bahru and Ipoh.

Two levels of flows are identifiable within the pattern. In the upper circuit of flows there is considerable overlap in the market areas of the four major production centres mentioned above. Boundaries of the market areas served by these centres are blurred. Inferences can be drawn for the overlapping of the market areas. Market overlaps reflect successful decentralization of consumer industry (import substitutes) from the major national production centre at Kuala Lumpur to Penang, Johore Bahru and Ipoh. It also reflects the ability of regional centres to attract the higher order of manufacturing units that cater for a national market rather than the less competitive immediate (local) market. Interchangeability of goods of these four major production centres which thus compete directly with one another, is suggested by the pattern. Discriminatory pricing system operating geographically could be another possible explanation.[1]

Cross-hauling could be another case of the market-area overlap. In the consumer non durable range, the same kinds of products travel in different directions

---

1. Hoover, E.M., Op.cit., P. 54-57.

between these production centres so that sharing of markets is evident. Furthermore, variations in consumer preferences could be a possible explanation for the ability of production centres to cater for the same wants by supplying different substitute products under different brands and styles.[1]

At the national-level of production the ability of manufacturing units in the four production centres to overcome transport costs and undertake long distant hauls such as Penang to Seremban, Ipoh to Johore Bahru, Kuala Lumpur to Kuala Muda is evident. This trend can be interpreted as a consequence of regional specialization for national production in certain products, within the broad consumer goods category as opposed to duplication and direct competition suggested earlier on.

At the subordinate level of flows which comprise of flows of lower order goods that constitute "local traffic"[2] in a wide range of consumer manufactures, occurs. A large number of short hauls that are intra-zonal or confined on the limited local market occur from a large number of small subregional centres. These subregional centres function both as production centres and distribution centres of products that constitute the 'local traffic'.

---

1. Ibid., P. 56.

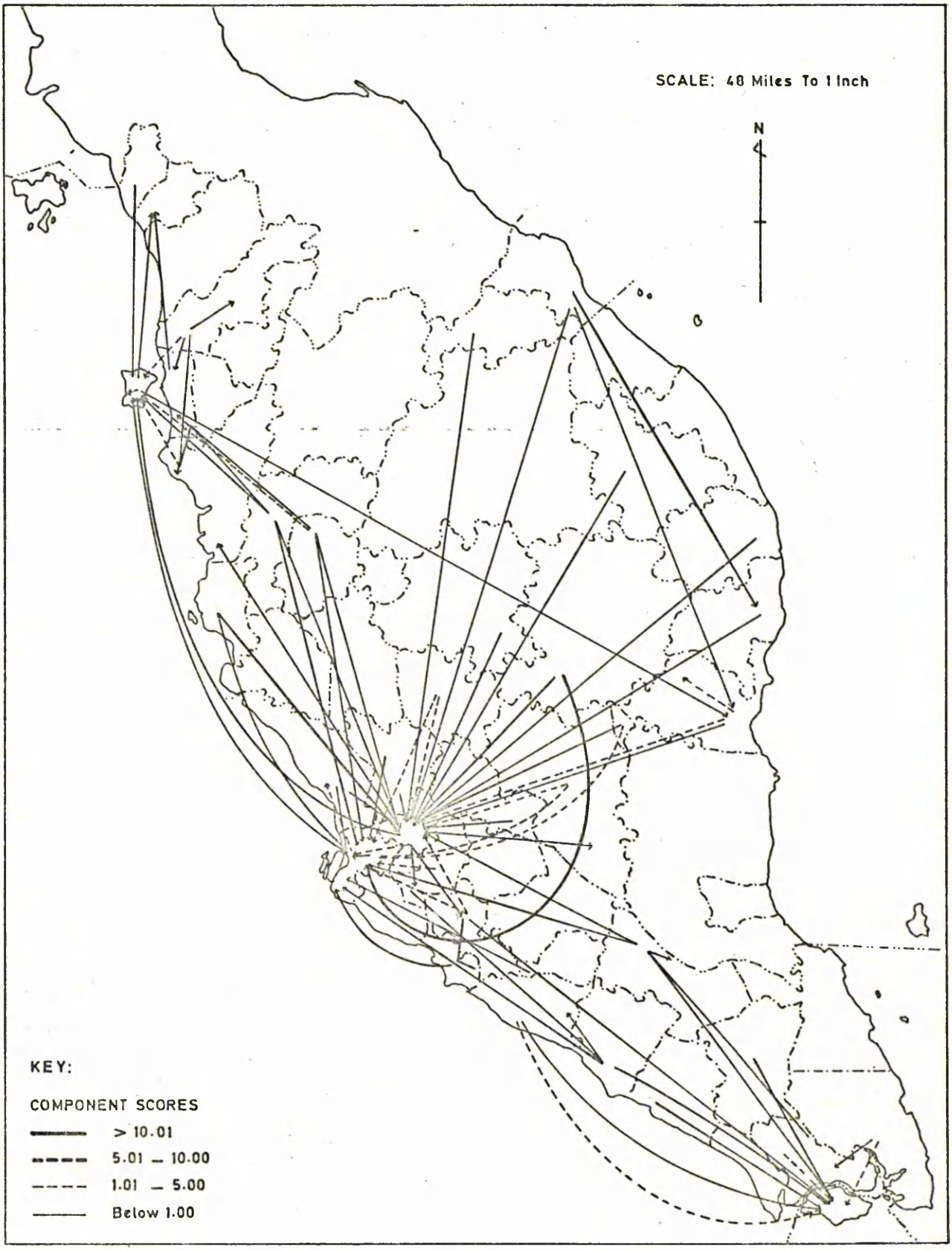
2. The distinction between 'local freight' which is essentially locally delivered in relation to intra-regional activities as opposed to interregional freight which sell on regional and national markets is also made by M. Chisholm in the study below:
Chisholm. M., Freight transport costs, industrial location and regional development, in (Eds) Chisholm. M., and Manners, G., Spatial policy problems of the British economy, Cambridge University Press, 1971, P. 220.

Kangar, Alor Star, Sungei Patani, Taiping, Kuala Kangsar in the north-west, Kota Bahru, Tanah Merah, Kuala Trengganu in the north-east; Mersing, Batu Pahat, Muar in the south-west are a few outstanding examples. However, there are evidences of production centres in the transitional stage from the 'local' production to production for a national or inter-regional market. This is reflected in a few hauls (of low intensity) to the major regional markets of the larger production centres. Malacca Central, Kota Bahru, Seremban, Taiping are examples.

The spatial coexistence of major markets and areas of production is significantly revealed and seem to coincide with the four major urban centres in West Malaysia. It is also significantly indicated that the circuit of flows is confined to the west coast. The only flows to the east coast markets are those from Kuala Lumpur to Termeloh and Kota Bahru and from Kuala Kangsar to Kuala Lipis. Flows from Kota Bahru to Kuala Lumpur reflect its minor role in 'regional' production. The 'isolation' of the east coast states from the major markets and production/distribution centres is in part a reflection on the physical barrier posed by the mountainous backbone of the peninsula and on the absence of transport links between the north-east and the north-west. It is also a reflection on the region's comparatively low socio-economic position.

Figure 8.3 displays commodity flows of resource-based manufactured products and semi-processed products. The pattern is generally dominated by the flow of the latter commodities (rubber and oil palm) because of the volume of

Fig.8.3 THE PATTERN OF COMMODITY FLOWS FOR RESOURCE-BASED MANUFACTURED GOODS AND PROCESSED COMMODITIES (COMPONENT 2)



flow involved.

The importance of the Klang Valley as a recipient (market/collection centre) is displayed in Figure 8.3. Rubber and palm oil are basically export-oriented commodities. Movement of these two semi-processed products from the resource-rich supply areas in the east-central and northern parts of the country respectively to the ports of Klang and Butterworth/Penang and intrazonally from Kuala Lumpur to Klang is a facet of the open-dualistic nature of the economy. Singapore in the south is another major outlet for these products. It handles the produce from Malacca, Batu Pahat and Johore Bahru.

Unlike the flow pattern of consumer non-durables and inputs which reflect coexistence of market and supply areas this group of commodities displays a flow pattern from agricultural resource rich areas (primary products) to the major urban centres and ports. The supply areas and markets are spatially separate. It is a flow pattern that emphasises export orientation as opposed to import-substitution in the preceding flow pattern. As a consequence, the dominant streams of movement are from the northeast and east to the west of the peninsula. Supply centres in Kuantan, Raub, Termeloh, Maran, Kota Bahru send their produce directly to Kuala Lumpur or to Port Klang. The Klang Valley controls the largest hinterland or supply area.

The bulk of the flows are short hauls reflecting the bulkiness of the produce and the limitations imposed by transport costs on distance. Direct movement of produce from Seremban, Kajang, Rawang, Kuala Selangor to Port Klang are examples of short hauls.

In the east coast Kuantan acts as a regional collecting centre for intra-zonal and inter-zonal flows. It controls a hinterland (supply area) as far north as Kota Bahru although some direct commodity movements from Kuala Trengganu and Kota Bahru to Kuala Lumpur and Port Klang also take place.

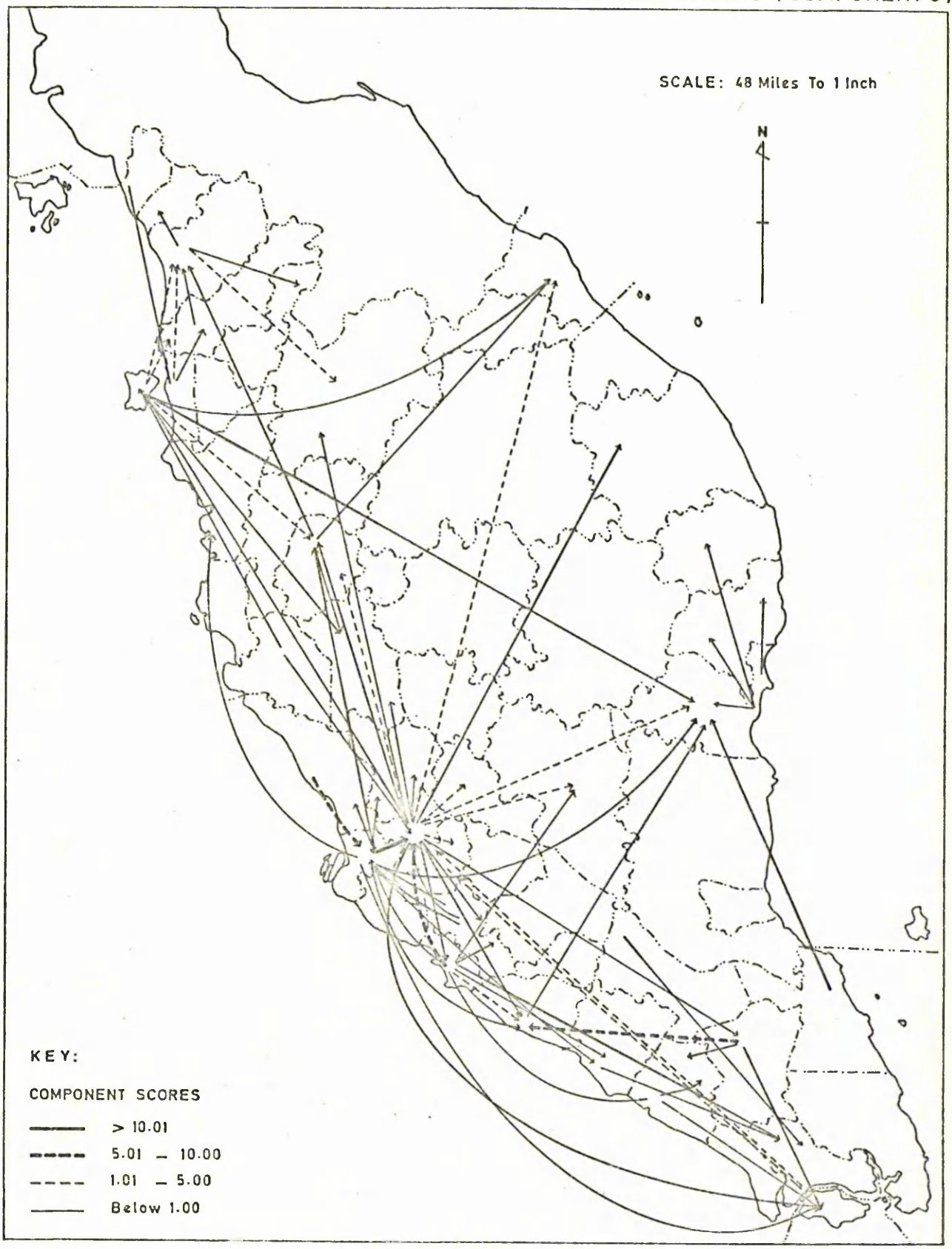
In the north-west the importance of Penang/ George Town as a regional market and port is well defined. Its zone of influence (supply area) extends as far north as Perlis and as far south as Kinta and the Dindings. Being a main port in the north-west, it has placed Ipoh in an unimportant position on this flow pattern.

The third group of commodity flows are those of manufactured goods based on imported raw materials or parts. (Figure 8.4). The highest intensity of flows occurs within the Klang Valley from Port Klang as the source of imported raw materials and components to Kuala Lumpur and Klang districts as the main centres of production of manufactured goods and sites of assembling plants.

The importance of Kuala Lumpur as a national production centre of these products is indicated by the pattern of flows that radiate out to all parts of the peninsula from it. Its major markets, however, are confined to the west coast urban centres of Penang, Ipoh and Johore Bahru. It also supplies Kuantan and Kota Bahru.

Port Dickson is an important supply centre. Flows from Port Dickson to Kuala Lumpur and Malacca indicate its role as a sole source of supply and centre of the petroleum refining industry.

Fig:8·4 THE PATTERN OF COMMODITY FLOWS FOR MANUFACTURES BASED ON IMPORTED RAW MATERIALS OR COMPONENTS (COMPONENT 3)



The position of Penang as a production centre in the north-east is also well defined. It serves the markets in the north-west to as far south as Ipoh. It also supplies the Kota Bahru region.

Some overlap between the market areas occur in the fringe areas of the zones of influence of the production centres of Kuala Lumpur, Ipoh and Penang but the market overlaps are less marked than those in consumer non-durables.

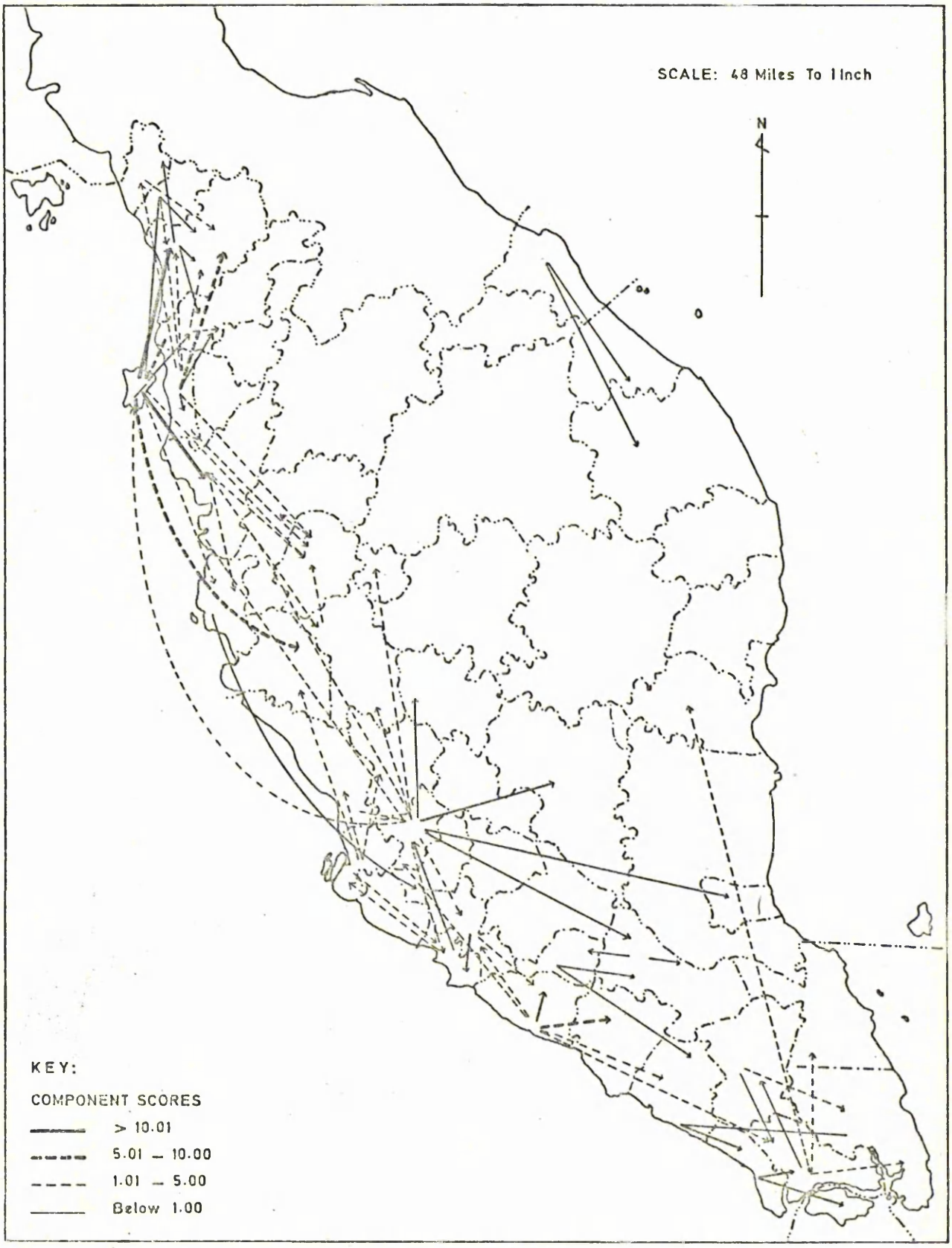
In the south Kluang is another important regional production centre and supplies mainly Malacca and parts of the Johore State. Johore Bahru is also other production centre with supplies directed to the Kuala Lumpur zone.

In the east coast Kuantan is an important distribution centre. Commodity movements to Dungun, Kemaman and Termeloh take place from Kuantan. In turn, it receives products from the Penang and Kuala Lumpur production centres.

Commodity flow pattern of this group of commodities reflects inter-regional and national based operations with Kuala Lumpur as the most important 'national' production centre supported by regional production centres which are the major urban centres.

Figure 8.5 depicts patterns of flows of bulky commodities such as fertilizers and beverages. The impact of weight and volume factors on transport costs are reflected in the short distance hauls and the movement from a large number of distribution centres serving the localised markets. The distance-decay factor gives rise to a regional system of centres and subcentres that retail the products.

Fig:8·5 THE PATTERN OF COMMODITY FLOWS FOR BULKY MANUFACTURED GOODS (COMPONENT 4)



The pattern of flows of these commodities reflects 'local traffic' which is intra-zonal and interzonal. It is different from the regional and national flow patterns discussed earlier on. It is similar to the lower order flow pattern of consumer non-durable products.

A large number of centres and subcentres with short hauls can be identified. In the north Georgetown and Butterworth stand out as regional production centres supplying markets in the agricultural districts of Kedah, Perlis, Krian and Lower Perak. At the subregional level, distribution centres such as Kubang Pasu, Alor Star and Sungei Patani control short hauls within their respective zones and in the adjoining zones.

In the central section of West Malaysia, Kuala Lumpur, as expected, functions as the regional production centre with a market extending to as far north as Cameron Highlands. It also has a zone of influence extending into areas served by Penang but overlaps are few. In the south it markets into Seremban and in the east as far as Termeloh. Subordinate to it are the subregional distribution centres of Klang, Port Dickson, Malacca Central, Tampin and Muar.

In the south the importance of Johore Bahru as a regional production distribution centre is evident although it is of lesser importance than Penang (reflected by the intensity of flows). It serves markets in Kuantan Mersing and Kota Tinggi. Subordinate centres at Batu Pahat, Pontian, Kluang control the 'local traffic' or retailing of the products intra- and inter-zonally.

Very bulky resource-based commodities such as logs and bricks show a pattern of flows very different from that of the bulky manufactured goods. (Figure 8.6). The pattern is dictated mainly by the movement of logs because of the larger volume of flow involved. The pattern is influenced by three factors, namely the location of supply areas of exploitable timber resources, the centres of demand and the transport system linking the supply areas to demand centres for the different varieties of timber. These factors explain the magnitude of flows from Pahang (the major timber resource-area) along the shortest and direct route to Kuala Lumpur, the major market. Large volume of flows from Kuantan, Jerantut, Termeloh, Raub, Bentong, and Maran are directed to Kuala Lumpur.

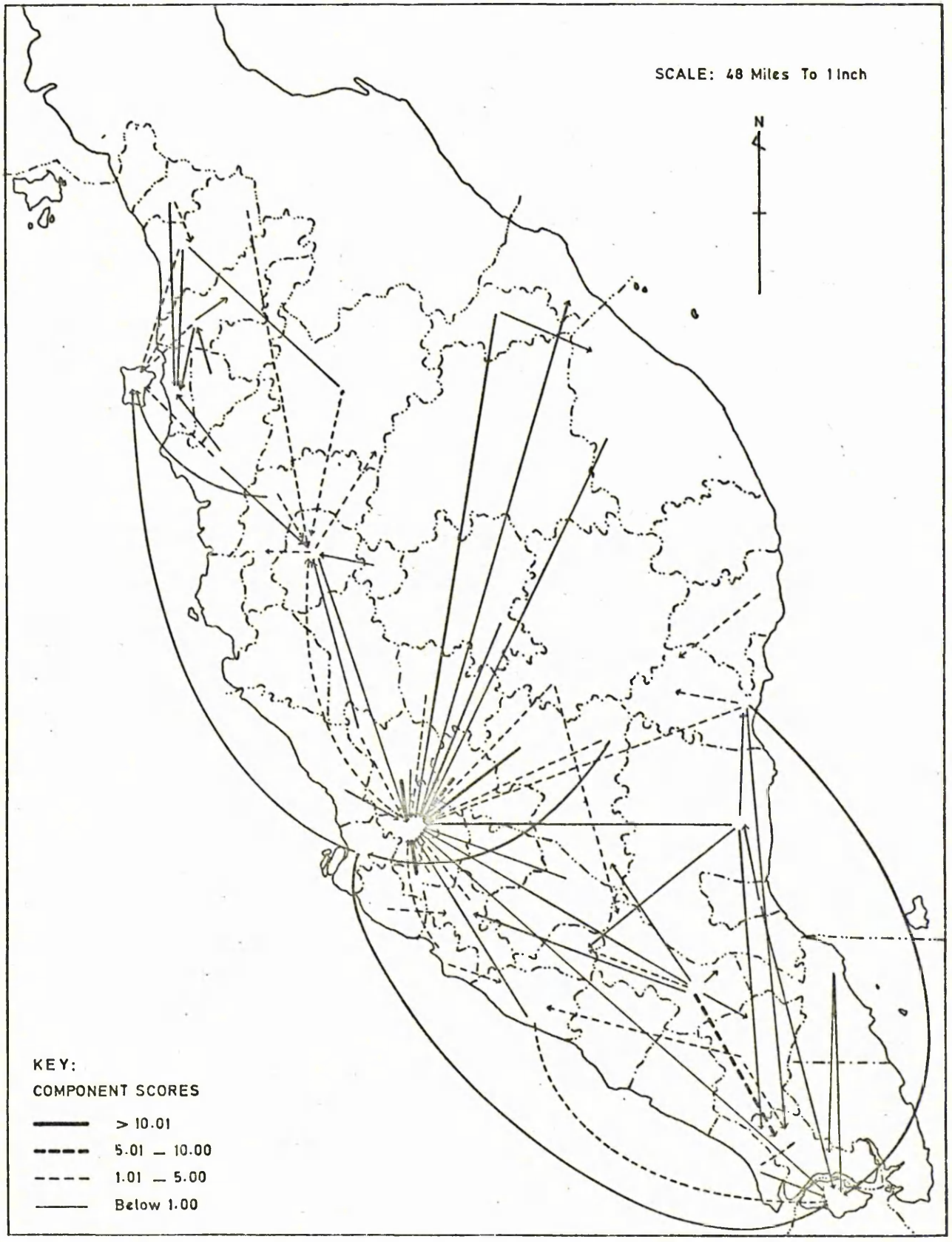
Alternatively logs move southwards from Kuantan, Kemaman and Pekan to Johore Bahru and Singapore and from Jerantut along the Segamat highway to Segamat.

Reference here is made to a study which undertook a regression analysis on freight flows of timber and distance using the volume of timber flows from 23 origins (forest checking stations) in Pahang[1] to consumption points in Kuala Lumpur in Selangor at varying distances ranging from 25 to 200 miles. It produced a correlation coefficient of 0.71 confirming the positive effects of distance decay

---

1. Khoo Yoke Kuan, 'The East-West Highway Project: Analysis of the Potential Impacts of Transportation Investments on Regional Development'. Unpublished M.A. Thesis, University Sains Malaysia, 1975, P. 108.

Fig:8.6 THE PATTERN OF COMMODITY FLOWS FOR VERY BULKY RESOURCE-BASED PRODUCTS (COMPONENT 5)



function on flow volumes.

These results can be applied to explain the pattern of flows of very bulky commodities. The effect of distance on log movement can be inferred as the reason for the lower intensity of flows from Kota Bahru in Kelantan and Dunqun in Trengganu to market areas in Kuala Lumpur. It can also explain the absence of flows to Penang from the north-east, especially since direct road link between these two areas is non existent.

Despite the effect of distance decay function on long hauls of timber, timber processing centres and manufacture of wood-based products, surprisingly, are not located within very close proximity to areas of supply. Industry producing wood-based products indicates a preference for market-orientated locations rather than raw material-orientated locations. This phenomenon reflects, possibly, the cost considerations of transport costs of inputs over long hauls against the cumulative effects of distribution costs of relatively less bulkier final products over an array of markets. The latter are compensated by inter-industry linkages and other benefits termed 'external economies' in market-orientated locations. The co-existence of markets and ports for export purposes tends to tip the balance in favour of west-coast locations.

The pattern on figure 8.6 shows that the above mentioned explanations can be put forward, albeit tentatively, as reasons for the location of wood-based industries in the west coast. This statement, however needs to be qualified. There are signs of the emergence of new production

centres of wood-based industry in resource-supply areas tieing production centres to raw material supply areas. This trend can be inferred from the intra- and inter-zonal movement of very bulky resource-based commodities into Kuantan from Kemaman and Pekan instead of the flows outwards from these areas to markets in the west and the south. Movement eastwards of production of wood-based industry shows that as the scale of output for these products has increased with export promotion and increase in demand in the country a shift in location has taken place. The substitutional location analysis can be put forward as an explanation for this change in location. In this case the transport outlays to markets substitute the transport outlays for raw materials.[1]

As the demand and the supply areas of very bulky resource-based products are spatially distinct except for the recent developments long hauls are shown on this pattern of flows. This implies that the effect of distance is only passive in the regression analysis referred to in the preceding discussion. Distance effect, as the author correctly points out is not non-existent but inherent in flow patterns.[2] But West Malaysian distances are not sufficiently great to cause significant economic differences between short and long hauls.

---

1. Isard. Op.cit., P. 175, 176.

2. Khoo Yoke Kuan, Op.cit., P. 109.

Transport costs of 9.059[1] cents per ton mile for logs is bearable. Moreover, as freight costs do not increase proportionally with distance, but on a sliding scale, the net effect is that the supply of good quality logs overrides the problem of high transport costs. Thus, volume of flows between various origins and destinations is, in the final analysis an equilibrium of supply and demand conditions.

This is reflected in the pattern on figure 8.6. where a large number of short and long distance hauls of varying intensity occur in the west coast. While destinations in Kuala Lumpur, Ipoh, Penang and Johore Bahru rely on sources of supply which are nearest, there is a high degree of cross-hauling. Long hauls take place from Klang to Penang and from Kuala Lumpur to as far south as Johore Bahru. Movements of logs also take place from Ipoh to Alor Star and from Upper Perak to Kuala Lumpur. From this long circuit of movements it can be inferred that wood-based industries tend to "import" perhaps specific qualities of logs or have logging contracts from supply areas far away at the expense of higher transport costs.[2] The fading intensity of long hauls with distance confirms that this process is limited in the extreme by the distance decay factor.

---

1. Khoo Yoke Kuan, Op.cit., P. 102.

2. These arrangements with loggers were noted in the East-west Highway Project. Ibid., P. 99.

The national and the international importance (as export commodities) of flows of this commodity group highlight one facet of the dualistic character of the West Malaysian economy. The link between resource-rich areas and production centres (urban based) is depicted by the flow pattern.

Figure 8.7 presents a pattern of flows for grain and grain products. A localised flow pattern with five well-defined regional centres (production and distribution/ collection centres) with their own zones of influence (market areas/supply) is evident.

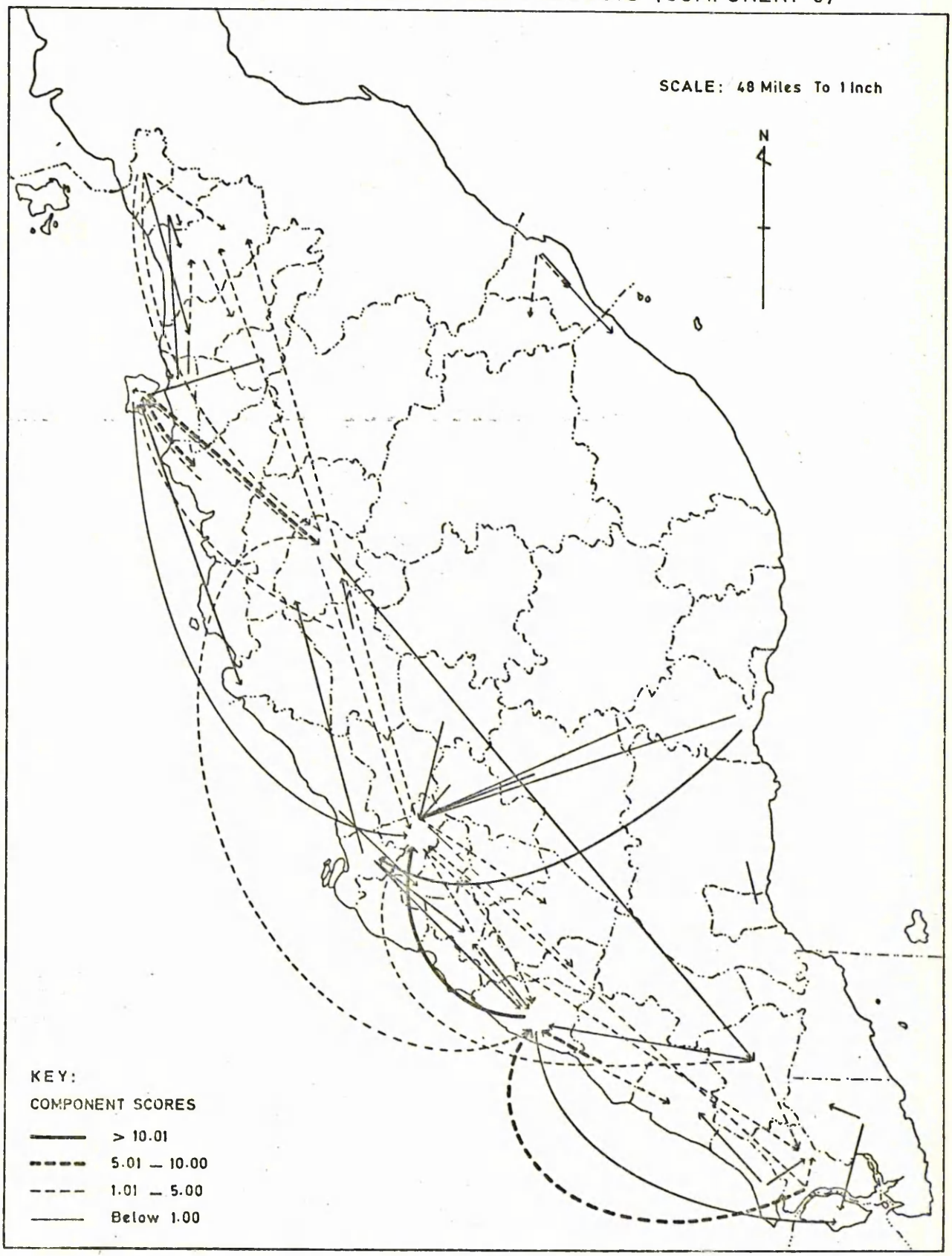
The most important centre is Malacca with maximum volume of flows of grain and grain products to Kuala Lumpur. It also supplies the southern districts of Negri Sembilan. Johore Bahru is another important centre in the south with flows to Malacca, Muar and Batu Pahat are of subregional importance in the south.

Ipoh controls distribution in the north-central region with flows to southern Perak and Kuala Lumpur districts. In turn it receives supplies from Klang.

Penang is the regional centre in the north-west with intra-zonal flows, and inter-zonal flows of grain products to agricultural areas in northern Perak particularly Krian, Larut/Matang and Kuala Kangsar. It also receives grain from the agricultural areas. Kangar is a subregional distribution centre in the far north serving the Perlis-Kedah agricultural belt.

In the east coast the volume of flow is limited. Kuantan is the main centre. It sends grain to Kuala Lumpur.

Fig:8.7 THE PATTERN OF COMMODITY FLOWS FOR GRAIN AND MANUFACTURED GRAIN PRODUCTS (COMPONENT 6)



Small quantities of grain also move out from Maran, Raub and Termeloh to Kuala Lumpur which is an important production centre. Kota Bahru serves its own zone.

The "local traffic" is examplified by the flow pattern. It reflects intraregional activity involving agricultural areas as supply centres and markets and regional centres as collection centres/distribution centres and production centres for grain and grain products.

8.5 Results of the Analysis and validity of the hypotheses generated

The study deals only partially with the total process of regional and inter-regional exchange. The analysis is limited to flows of a few commodities by road. Thus the exchange of similar goods by other modes of transport as well as exchange of other commodities, services and benefits has been excluded.

Hence, bearing in mind the limitations of a sample of flows patterns, dogmatic conclusions cannot be made. However, some deductions can be made from the patterns that have been identified.

The subordinate level of flows in the pattern of flows of consumer nondurables together with the patterns of flows of bulky manufactured goods and grain and grain products gives rise to a type of flows which can be classified as regionally based. The freight generated and attracted in this category is essentially related to localised activities at the intra-regional level. The perishable or

bulky nature of some of these commodities seem to encourage dispersion or splintering of production in and distribution from a large number of small centres. This category of products appear to be unaffected by the advantages of economies of scale or from the spatial advantages of agglomeration.

The second category of commodity flows are those which are interregionally and nationally based. This category is represented by the flow patterns of the upper or higher order of consumer non-durables, resource-based manufactured products and semi processed products, products based on imported materials and very bulky resource-based products. Manufacturing centres producing these products or dependent on resources for production of goods are confined to the major urban centres. Polarization of manufacturing units in the four major urban centres reflects the importance of the advantages of spatial agglomeration. Importance of the Klang Valley (Kuala Lumpur and Klang), Penang, Johore Bahru and Ipoh as production centres is evident in most of the patterns in this category of flows. A market-orientated production is highlighted although the coexistence of major markets and ports supplying the imported raw materials and parts in the west coast regions where the major urban centres are located reduces this conflict. Market-orientated location of manufacturing units can only be spoken of in the manufacture of resource-based products where the supply areas are isolated from the markets.

The hypotheses set out at the beginning of this analysis can now be evaluated based on the dichotomous

classification[1] of commodity flows.

The regionally-based flows lend support to the first hypothesis that the lower order goods give rise to small scale operations dispersed over a large number of centres with a great many short distance hauls between the centres and the hinterlands.

The /inter-regionally and nationally based pattern of flows emanate from the four production centres concentrated in the major urban centres or alternatively, the flows are directed to the major urban centres. Major urban centres correspond to areas of high economic well-being. Hence the hypothesis, that the greater the economic accessibility, the larger the volume of freight attracted and generated is valid in the West Malaysia context. The range and intensity of flows from the four production centres also supports the hypothesis that the greater the economic accessibility the larger the effective market areas of higher order goods.

A comparison of the distance of hauls and the intensity of flows of the economically backward areas (zones in Pahang, Kelantan and Trengganu) with those of the economically advanced areas (west coast zones with the urban centres) confirms the validity of the hypothesis that the lower the economic status of the region, the more isolated is the region from the main stream of flows. The economically backward areas have long hauls to the relatively advanced

---

1. Chisholm, M. Op.cit., P. 229.

areas.[1]

The last hypothesis that bulky low value products emanate from a large number of origins and have short hauls consigned to the immediate hinterlands can be partially rejected. If the goods are regionally-based then the hypothesis is valid but for nationally based bulky products such as logs, the equilibrium between the markets and supply areas tend to overrule costs of transport. However, the basic pattern of demand demonstrates attempts to seek shorter hauls from the nearest supplies, or locate industry at close proximity to supplies.

8.6 Relationship between the patterns of outflows and inflows

The patterns of flows of the six commodity groups if superimposed would display a large degree of interrelatedness in the form of outflows and inflows along one and the same O-D dyad. Any attempt to investigate the interrelatedness and possible interdependence of interregional activities brings to mind Leontief's interregional input-output technique of analysis. In this study, given the nature of the data available, such an approach is not possible. It is also not ideal as it fails to take into consideration spatial aspects.[2] As an alternative a canonical correlation

---

1. Similar conclusion was reached by Allen Pred in the analysis of flow characteristics of manufacturing firms located in areas of high, low and intermediate accessibility. Pred, A., 'Toward A Typology of Manufacturing Flows', The Geographical Review, Vol. 54, No. 1. 1964, P. 74.

2. Isard, W., 'Methods of Regional Analysis', M.I.T. Press, Cambridge, Mass., 1960, P. 310.

between inflows and outflows of the six component groups of commodities is attempted.

The objective of this analysis, using the above technique, is to discover the mutual interrelationships between regions based on the entire network of flows characterised by the production and distribution of six groups of commodities. The extent to which regional complementarity[1] influences the inflows and outflows along similar circuits of interactions will be analysed.

As the first step, the component scores on the sets of dyads (O-D pairs) are separated into two sets, one for inflows of all the six commodity groups and the other for outflows of the same groups. A total of 679 dyads are obtained for each set after eliminating intra-zonal dyads. Canonical correlation analysis is then applied with 6 components of inflows in one set and 6 components of outflows in the other set.

Results of Canonical Analysis

Four canonical variates are obtained from the analysis as shown in Table 8.4. The first variate shows a high and significant correlation of 0.92 between inflows and outflows. The second variate shows a correlation of 0.83 on the residual variance. The third and fourth variates

---

1. Ullman, E.L., American Commodity Flow, University of Washington Press, Seattle, 1957.

Table 8.4 CANONICAL VARIATES IN COMMODITY INFLOW AND OUTFLOW ANALYSIS

Variate	Eigen-Value	Canonical Correlation	Wilk's Lambda	Chi-Square	Degrees of Freedom	Significance
I	0.854	0.924	0.032	2304.5	36	0.00
II	0.687	0.829	0.223	1008.9	25	0.00
III	0.199	0.446	0.713	227.4	16	0.00
IV	0.107	0.327	0.890	78.5	9	0.00

reflect a lower degree of interrelationship (correlations of .45 and .33 respectively) but they are also significant.

The canonical variates can be interpreted from the loadings of the variables (components) on the four variates (Table 8.5). The redundancy measures of the first set when the second set is available and vice-versa are also shown and the variance extracted by each set has been calculated.

Although the canonical correlations are significant and the four variates extract four relationships between inflows and outflows, the explanatory powers of the variates (indicated by the variance extracted) are low. This can be explained by the fact that only six components with a cumulative variance of 53 per cent are chosen. However, the total redundancy measure which is used as a confirmatory test of the significance of the interrelationships is high. It is 33 per cent for the first set when the second set is available and 31 per cent for the second set when the first set is available. Hence, the four variates can be interpreted as four significant patterns of interrelationships between commodity outflows and commodity inflows.

The four interrelationships can be interpreted as follows:-

1. On canonical variate I a large outflow of resource-based manufactured products and semi-processed products is significantly correlated with a large inflow of products of secondary industry dependent on imported raw materials or parts. This variate explains 18 per cent of the variance of outflows and 15 per cent of the variance of inflows.

Table 8.5 CANONICAL VARIATE STRUCTURE, VARIANCE EXTRACTED AND REDUNDANCY MEASURES OF COMPONENTS

Outflows	Canonical Variates				
	I	II	III	IV	
Group I	-0.I95	-0.996*	0.I34	0.045	
Group II	-0.989*	0.I53	0.074	-0.058	
Group III	-0.054	0.052	-0.344	0.I63	
Group IV	-0.I04	0.I05	-0.994*	0.275	
Group V	-0.077	-0.II7	-0.036	0.437*	
Group VI	0.063	-0.085	-0.I59	-0.927*	
Variance Extracted	0.I76	0.I75	0.2I4	0.I93	Total Redundancy of first set given to second set = 0.334
Contribution to Redundancy	0.I50	0.I20	0.043	0.02I	
Inflows					
Group I	-0.I04	-0.93I*	0.278	-0.I56	
Group II	-0.255	0.03I	-0.889*	-0.285	
Group III	-0.908*	0.I30	0.428*	0.092	
Group IV	-0.024	-0.240	-0.230	0.883*	
Group V	0.020	-0.047	0.004	0.034	
Group VI	-0.I06	-0.36I	-0.3I2	0.200	
Variance Extracted	0.I52	0.I79	0.200	0.I56	Total Redundancy of second set given to first set = 0.3I0
Contribution to Redundancy	0.I30	0.I23	0.040	0.0I7	

Note: The commodity flows that interact to produce a relationship are marked with an asterisk*.

It constitutes less than half of the total redundancy of outflows given the inflows.

In this component outflows of products such as rubber, palm oil, plywood, veneer, construction materials, household furniture explain variations in the inflows of assembled manufactured products such as machinery, textiles, petroleum and petroleum products. This relationship shows that demand for the latter category of commodities (elastic demand) is dependent on the earning capacity of resource-based products. It is an expression in commodity flows of the manner of operation of the dualistic character of the West Malaysian economy.

2. In canonical variate II large outflows of consumer non-durable products and inputs are associated with large inflows of the same products. This component explains intense competition among import-substitutes within the domestic market. Regional specialization in individual items or products within this large category of commodities could result in cross-hauling and give rise to outflows and inflows of different individual items classified within the same broad group.

In this variate both inflows and outflows explain 18 per cent of the variance in each set and constitute 12 per cent of the redundancy of one given the other.

3. On canonical variate III a high outflow of bulky manufactured goods (fertilizers, salt and beverages) are positively correlated with large inflows of resource-based

manufactured products and semi-processed products and to a lesser extent negatively correlated with inflows of assembled manufactured products based on imported raw materials.

This component explains the collecting and distributing and production function of urban centres in the exchange of commodities between regions and the function of ports which import and export a wide range of commodities. The variance extracted by this variate for inflows is 20 per cent and for outflows it is 21 per cent but the redundancy of one set when the other is available is low (4 per cent).

4. In canonical variate IV high outflows of grain and grain products are negatively correlated with inflows of bulky manufactured goods (fertilizer, beverages and salt) but outflows of logs and bricks are positively correlated with inflows of bulky manufactured products.

The first relationship suggests that although there appears to be a dependency on transactions such as fertilizer (as an input) in agricultural areas with a surplus, the relationship is not positive. Inflows of fertilizer do not depend on the returns from grain and grain products. They are an essential input not tied to returns. On the contrary, returns from very bulky resource-based products (bricks and logs) could influence the inflow of bulky manufactured products into the region.

This component explains only 2 per cent of the variance in the first set and 15 per cent of the variance in the second set. The redundancy of one set given the other is only about 2 per cent.

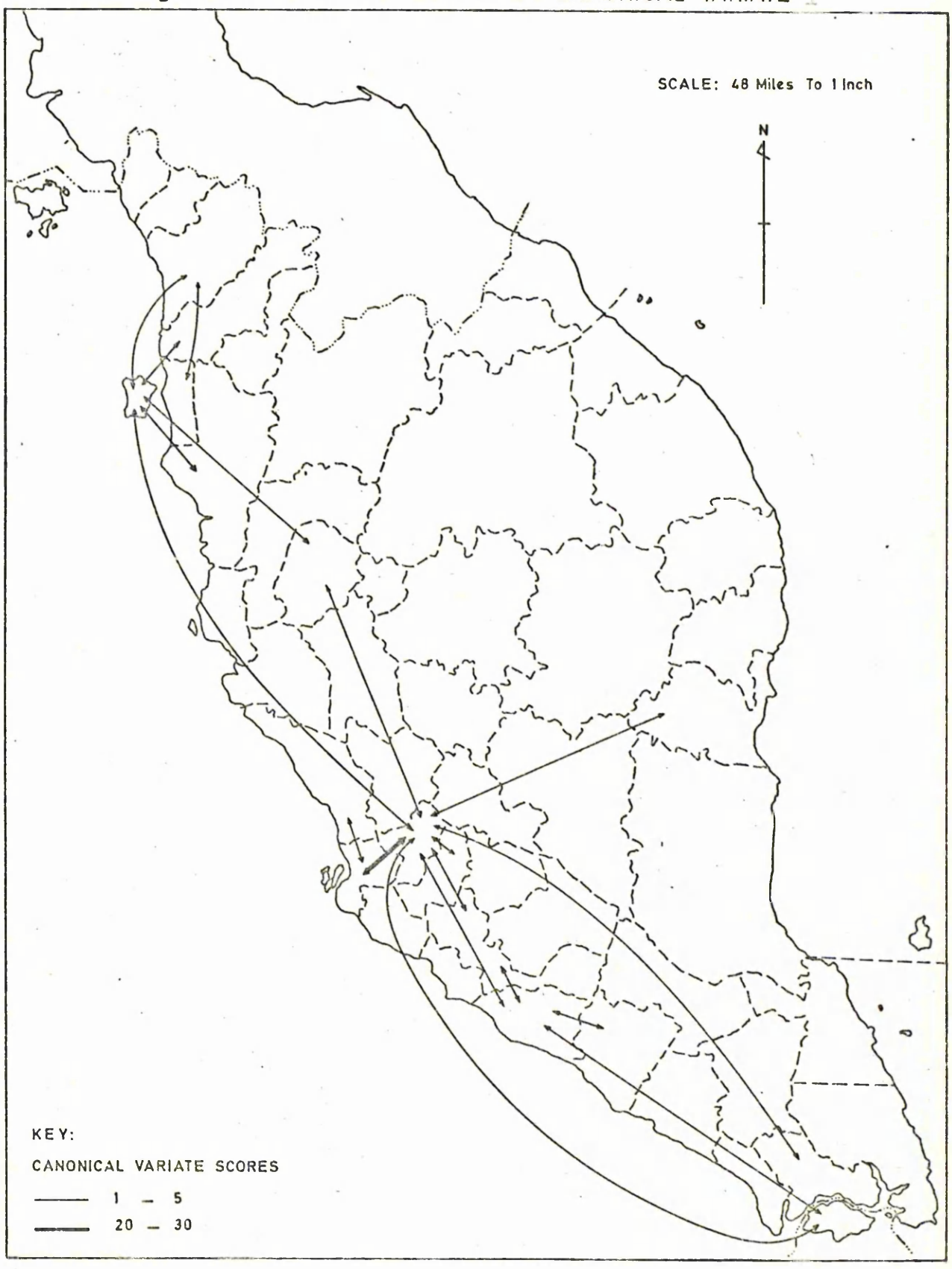
The implications of these relationships which highlight the structure of the West Malaysian economy can be further analysed by identifying spatially mutual interactions of varying levels of importance (these can be deduced from the variate scores).

The canonical variate scores on the four canonical variates are mapped in Figures 8.8 to 8.11 to identify the spatial patterns of interrelatedness of regions on these variates.

Figure 8.8 shows the interflows of resource-based manufactured goods including semi-processed commodities and assembled products and products of secondary industry based on imported raw materials or components. It suggests the dominance of Kuala Lumpur. The largest amount of spatial interaction (inflows and outflows) occurs within the Klang Valley with Klang and Kuala Lumpur as the hub of the West Malaysian economy. Other dyads with spatially mutual interactions confirm the importance of zones with large urban centres. The importance of Penang, Johore Bahru, Malacca, Ipoh and Kuantan is emphasised. Other growth centres (less dominant) displaying interactions, are Butterworth, Sungei Patani in the north-east, Seremban, Muar, Kajang and Batu Pahat in the centre and south-west.

The inflows and outflows are between two nationally based commodity flows reflecting the spatial interactions displayed by the dualistic function of the West Malaysian economy. The urban centres and ports operate as "pulse centres", of the economy in their functions as manufacturing centres of import substitutes and/or export-

Fig:8.8 INTERACTING REGIONS ON CANONICAL VARIATE I

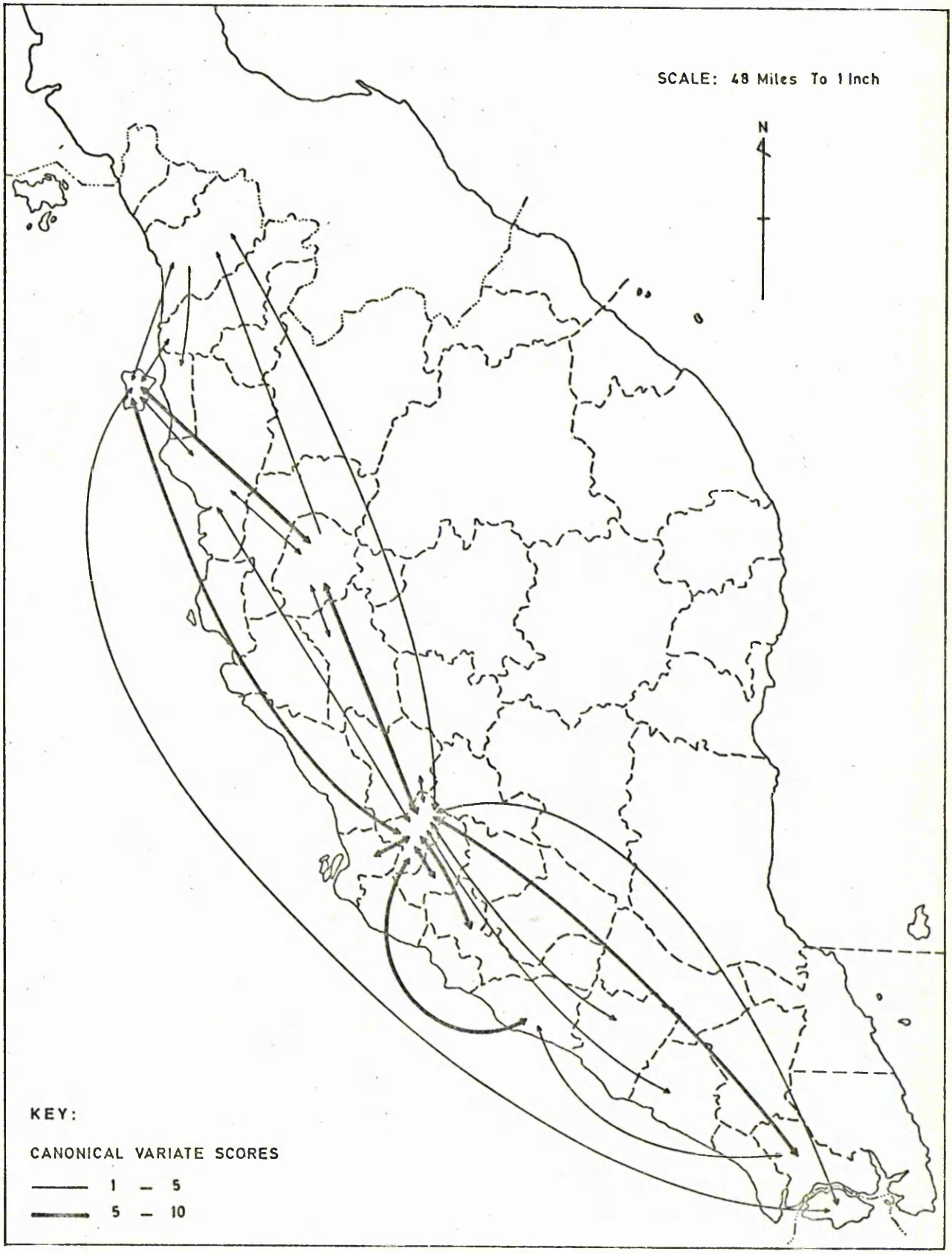


oriented production. In the process they link the commercialised agricultural and resource hinterland with the foreign (export) sector and they function as intermediaries in the link between the foreign (import) sector and the agricultural and resource hinterland. The intensity and zones of interaction, thus, form the basic locational circuit for constructing a system of growth centres in the process of industrial decentralization based on the strategy of import substitutes or export-orientation.

Figure 8.9 displays the pattern of interacting regions based on the inflows and outflows of consumer nondurable products and inputs. Again the emphasis in interaction is focused on Kuala Lumpur. Other centres with mutual interaction are Penang, Johore Bahru, Ipoh and Malacca. The greatest intensity of two way interactions occurs within the Klang Valley and between Kuala Lumpur and Penang, Kuala Lumpur and Ipoh, Kuala Lumpur and Johore Bahru, Kuala Lumpur and Seremban, Kuala Lumpur and Malacca and Penang and Ipoh. Mutual exchange between Penang and Singapore and Kuala Lumpur and Singapore for consumer nondurable products is indicated.

A lower intensity of interactions occurs between the major urban centres and their zones of influence. In this respect Kuala Lumpur has the biggest zone of influence. Transactions occur between Kuala Lumpur and Selangor and Negri Sembilan; and extend as far north as Kedah and as far south as Johore. Penang's domain of influence is in the northwest. Ipoh's domain of influence extends to Perak. The complete absence of interactions between the west and

Fig:8.9 INTERACTING REGIONS ON CANONICAL VARIATE II

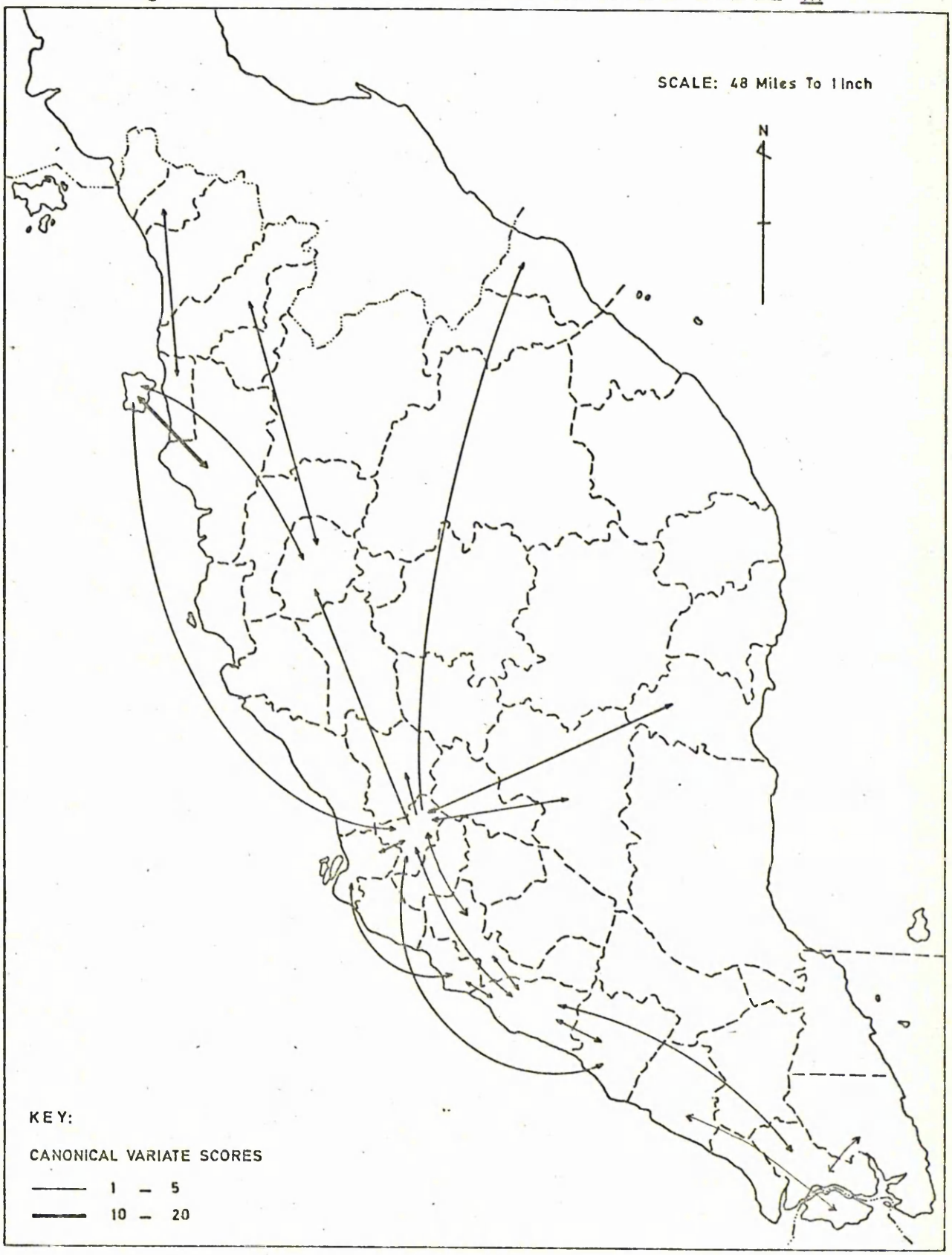


east coast regions (including Pahang) is highly suggestive of the absence of production centres in the east coast and reflects on the economic conditions in the east coast regions. The dominant pattern of interaction are confined to the west coast regions. The variate also points to a superstructure of transactions among the major urban centres. These transactions subsume the interrelationships between the urban centres and their hinterlands (zones of influence).

The complexities of industrial interdependencies and regional complementarity are expressed in Figure 8.10 based on the outflows of bulky manufactured products and inflows of resource-based manufactured goods and semi-processed products. Outflows of bulky manufactured products are also negatively correlated with inflows of products of secondary industry based on imported raw materials and components. The lower transferability of bulky products is evident in the short distance movements and connections between neighbouring regions. Unlike the patterns displayed in the first two variates, Penang and Johore function in separate hinterlands from the core area in the centre. This is because the regional importance of Penang, both as a port for the inflowing commodities and as a distributive centre for the bulky manufactured goods is well defined in the north Johore Bahru acts as a collecting and distributing centre in the south.

In the centre, Kuala Lumpur has the largest zone of interaction. Its central location, close proximity to Port Klang and the major road link with the central and east coast regions places it in the most appropriate position

Fig: 8.10 INTERACTING REGIONS ON CANONICAL VARIATE III



to serve as a collecting and distributing centre for central Pahang, and the most distant resource-region of Kota Bahru. It also maintains transaction with its immediate hinterland (Selangor and Negri Sembilan).

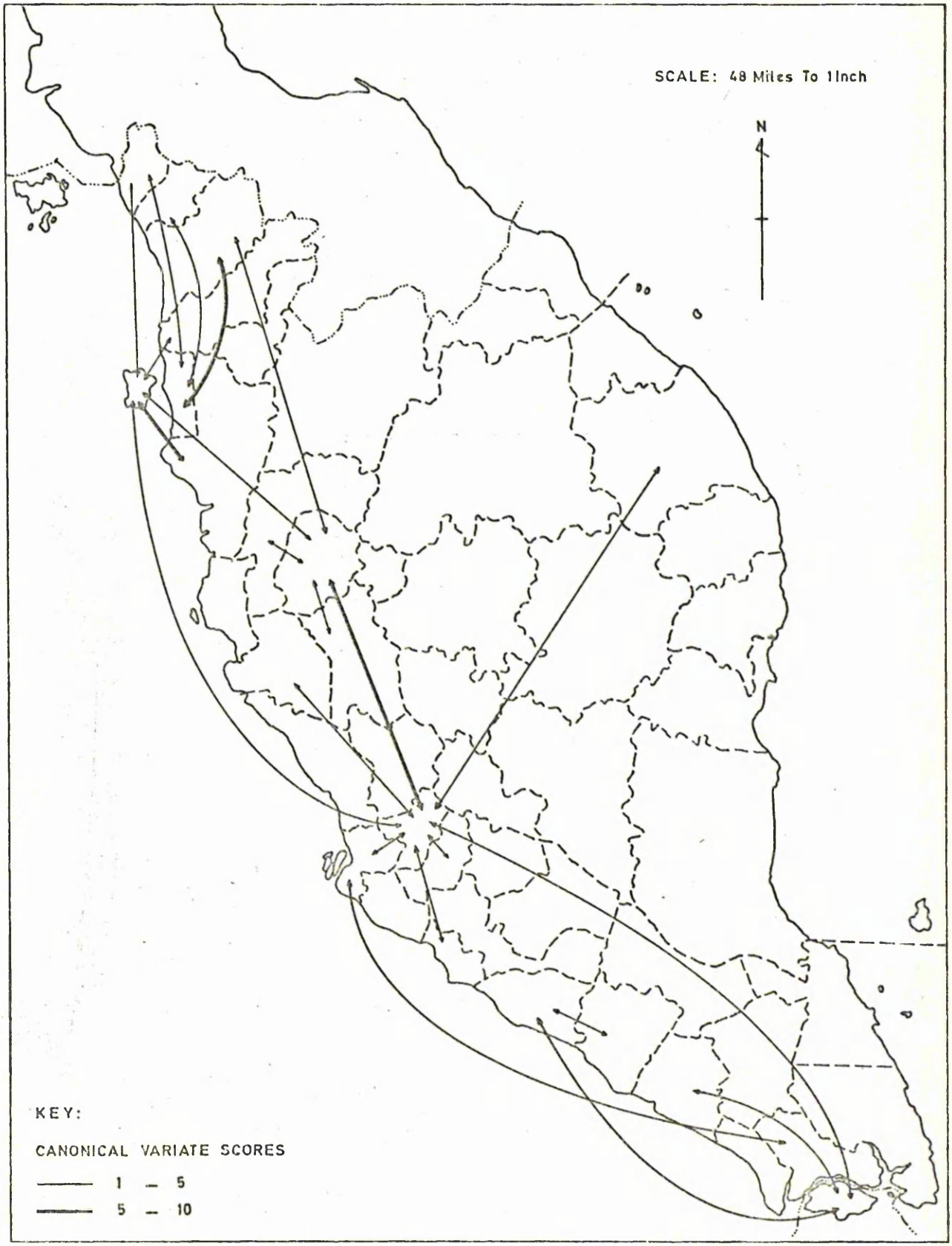
Inflows of assembled products and manufactured products based on imported raw materials are negatively correlated with outflows of bulky manufactured goods. This reflects the interdependencies among major urban and production centres as opposed to the urban-rural inter-relationships. Hence, the spatial pattern on this variate emphasises rural and urban interdependence and mutual interactions and interdependencies among urban (production) centres.

Figure 8.11 displays the pattern of interacting regions on canonical variate IV. (Outflows of grain and grain products are negatively correlated with inflows of bulky manufactured goods while outflows of very bulky resource based products are positively correlated with inflows of bulky manufactured products.)

The pattern of interdependencies between specialised regions is displayed on this variate. Regions of agricultural surplus and regions producing bulky resource-based products are dependent on the urban centres for bulky manufactured goods and as outlets for their produce.

The need for grain and resource-based products in the production process at the production centres and the availability of markets for manufactured products and chemicals in the regions involved in agricultural activities gives rise to a two-way traffic for these commodities.

Fig:8 .11 INTERACTING REGIONS ON CANONICAL VARIATE IV



These spatial (mutual) interactions examplify the inter-industry locational relationship interpreted as a mixture of supply-area and market-area systems by Hoover.[1]

These locational relationships are revealed in the two-way flows from Penang and Butterworth to the agricultural areas of Kedah, Perlis and Krian. The case of Kuala Lumpur and Klang with respect to Lower Perak, Ulu Langat and Kuala Trengganu, reveals a similar locational dependence. In the south transactions between Malacca and Singapore, Malacca and Muar, and Johore Bahru and Batu Pahat are also indicative of these locational interdependencies. Some amount of cross-hauling among the urban centres is also evident in the interactions on this variate.

8.7 Implications of Spatial Interactions on Industrial location and Regional development

Spatially mutual interactions based on the inter-flows (outflows and inflows) of six commodity groups confirms the dominance of a few major urban centres which interact more with one another than with their respective hinterlands. These interactions coincide with areas which display a comparatively high economic well-being. It would be perhaps more appropriate to say that they contribute to the high economic well-being of these areas.

Transactions among the major urban centres constitute a super structure with an upper circuit of inter-

---

1. Hoover, E.M., Op.cit., p. 49.

relationships which subsumes the well-known and often quoted interactions resulting from the open dualistic character of the West Malaysian economy.

Arising out of these forces of control it is consequential that the main circuit of interactions between the regions are confined to the west coast of the peninsula. Thus, the east coast regions are relegated to a peripheral position from the hub of activity. The patterns of interactions also confirm the regional disparities outlined in the preceding chapters and clearly go a long way to proving that the low economic well-being is the cause for the peripheral position and 'isolation' of the east coast regions. Their resource rich base is not a forceful factor in attracting raw-material oriented or resource-based manufacturing industry into these regions.

The intensity of interactions and the zones of interaction, and the stability of the pattern of interactions judged from the four relationships between outflows and inflows enables identification of growth centres that have spearheaded regional specialization, industrial decentralization and interregional dependencies. The pattern of growth centres suggest the possibility of industrial decentralization based on the strategy of import substitutes or export orientation although the dominance of Kuala Lumpur is obvious.

The pattern analysed is for the period 1971 to 1974, giving a five year period for some effects of the new economic policy measures to be expressed spatially. The potential of new lines of interaction into and out of Kuantan

and transaction into the resource-frontier zones of Kelantan and Trengganu are encouraging signs of change but the change is slow. This suggests that supply and demand forces in the form of regional interactions cannot achieve the non-economic (social) objectives of the new economic policy.

Commodity flow patterns and regional interactions based on interflows of commodities, confirm the views expressed in the last chapter that an upgrading of the regional socio-economic well-being is a pre-requisite to industrial decentralization. Flow patterns also draw attention to the inadequacy of transport links between the east and west which are obstacles to the equilibrium of supply and demand forces, thus hampering regional economic accessibility.

"The cause of action in which highway construction is a 'lead' factor in the development process"[1] can be applied to the east coast to accelerate the process of achieving an economic equilibrium with the west coast[2] although it is by no means the only remedy.

8.8 Results of the three approaches

Combining the analysis of the regional socio-economic structure and the entrepreneurs' locational

---

1. Gauthier, H.L., 'Least Cost Flows in a Capacitated Network'; A Brazilian Example, (Ed) Hurst M.E.E., Transport Geography, Mcgraw-Hill Series in Geography, 1974, P. 172-186.

2. Khoo Yoke Kuan, Op.cit.,

evaluation with the results of the spatial pattern of commodity flows, some explanations can be forwarded for the attractiveness of a few industrial sites which favour industrial polarization and counteract decentralization. These are:-

1. Although manufacturing industry capitalises on relatively low labour costs and surplus capacity of unskilled labour, high population density[1] and surplus capacity of labour is a characteristic of both urban and rural districts. Furthermore, rapid increase in urbanization and in urban unemployment rates have been brought about by migration. Major gains in population through migration occur in the large urban centres.[2] Hence, this factor (labour) which influences industrial location decisions is ubiquitously available, more so in urban than in rural areas.

2. Unlike the need for labour, the need for industry to be located in close proximity to ports, if it is dependent on imported raw material and/or export markets, thus, assumes a locational priority.

3. Industry which is dependent on imported raw materials or machinery (inputs) but caters for a domestic market seeks centrality to major markets relative to the importance of ports as supply areas. The locational coexistence of major

---

1. Simonsen, O.C., 'Land Use and Density Factors' Part 3 of Urbanization in Peninsula Malaysia, Special Projects, E.P.U., Nov. 1973, P. 4-6.

2. Simonsen, O.C., 'Population Distribution and Growth Patterns' Part I of Urbanization in Peninsula Malaysia, Special Projects, E.P.U., Nov. 1973, P. 68-69.

urban centres and ports or at least the close proximity of ports to urban centres which are invariably the major markets (indicated in the pattern of commodity flows) eliminates this conflict of the choice of alternative sites posed by these two locational factors.

4. With a well developed transport network especially in the west coast, industry prefers to select sites outside the urban centres but within their spheres of influence. By selecting sites in the urban-rural fringe areas, industry has additional advantages of comparatively cheaper and spacious land sites in the industrial estates, lower cost of resource materials (lower transfer costs) and lower cost of labour. These advantages offset the slightly higher transport costs of products to ports but as the locations are within close proximity of ports and markets these costs are minimal. Further, since 88 per cent of the West Malaysia's urban population is concentrated in the urban centres of the West coast, the emphasis, therefore, in all three approaches to an analysis of locational factors of production, is on the attractiveness of the west coast regions, especially the major urban centres. This also explains the emphasis in the entrepreneurial opinion poll on just a few factors of location in all the sites selected.

The impact of urbanization economies on industrial polarization are succinctly displayed by the West Malaysian pattern of industrialization.

The primary aim of distribution in addition to growth as the main objective of economic development, the growth of agricultural development as a resource base for accelerated development, the need for labour intensive methods of production, complementary role of industry in rural and urban development imply the need for an approach or a development strategy in the West Malaysian context that could bring about decentralization.

Although the analysis undertaken in this thesis is far from conclusive but the growth centre approach is suggested in the analysis of commodity flow patterns and the strong urban-industrial association.

A possible answer to a spatially diversified manufacturing sector may lie in a national urban strategy consisting of an integrated pattern of regional growth centres.[1] A national strategy is projected to be the most appropriate approach to the problem. Its effectiveness can be viewed from the following aspects:-

1. In generating an order of priorities in public investment expenditure, thus reducing the wasteful competition between States in the scramble for industrial projects through the creation of industrial estates and free trade zones.

---

1. The term 'growth centre' is defined according to its application in regional development planning. Adopting Darwent's explanation it is the identification of the place/centre which would be the focal point for investment and in which "economic and social development is initiated and transmitted to an area around it."

   Darwent, D.F., "Growth Poles and Growth Centres in Regional Planning - A Review.' Environment and Planning Vol. 1, 1969, P. 13.

2. In enabling constructive market analysis and planning of an industrial structure to avoid surplus capacity in production and manufacturing at suboptimum levels by a surplus number of establishments.

3. Counteracting the tendency towards a primacy pattern of urban-industrial growth centred within the Klang Valley, and overcoming "backwash" effects of such polarization.

4. Generating a linkage between the two components of the West Malaysian economy by planning growth centres based on alternative strategy of import substitutes and/or export orientation. This procedure could also provide common terms of reference for rural and urban planning which has been highly compartmentalised in the past.

5. Associated with the preceding advantage is the possible ability of the approach to redress ethnic and regional disparities which are spatially coexistent. In the process a diversion of inter-regional migration along the existing patterns to new growth centres could be incorporated.

6. Lastly, a national strategy could provide a common axis and guidelines for research programmes and development studies, thus avoiding the problems of varying assumptions and terms of references which have been applied to regional development programmes outlined in chapter four.

CHAPTER IX

CONCLUSIONS

Industrial location studies have progressed from the traditional micro-economic approach of the theory of the firm in explaining the individual firm's behaviour. Current research in manufacturing favours the use of the theory of the firm in understanding the processes of industrial location at the macro-level. Its focus is placed on spatial organization and aggregate locational behaviour within the complex interrelationships among the components of the economic structure. This approach is geared to the more dynamic role of industrial location studies. Their application to the planning of economic development at the intraregional, regional and national levels is a more productive contribution, reinforcing while at the same time extracting from the fundamental descriptive analyses. The study of the West Malaysian spatial and structural patterns of manufacturing in the context of industrial location has been undertaken to achieve these purposes. The two main contributions of the study are:

1) the tracing of the spatial and structural patterns of manufacturing from independence to the present day, relating their importance to the regional and national economies, and

2) the identification of the factors determining the industrial processes and patterns and the relevance of these factors to the achievement of the objectives of

industrial policy and industrial planning.

The thesis began with an account of the stage of development at the time of independence. After independence the move to diversify the economy of West Malaysia had its origin in the problems that were confronted by the country characterised by an open dualistic economy.

The diversification of the economy was planned on a two-pronged approach - the diversification of the agricultural sector with an emphasis on additional export-oriented primary products and the development of the manufacturing industry based on an official policy of industrial development.

The strategy of industrial development emphasised an indirect role for the Government in maintaining a suitable investment climate. A rapid rate of economic growth and economic stability were emphasised as the objectives of the move to diversify the economy.

The thesis proceeded towards an outline of the patterns of growth and structure from the dynamic state in 1957 to the end of the period of industrial growth based on a policy of laissez-faire. The performance of the industrial sector was assessed at the national and the district-levels using various measures of industrial development. Although the Government did not state all its objectives explicitly, there were implicit objectives in the policies followed. The performance of the sector was evaluated in the light of these objectives.

The diversification of the economy was achieved at a very impressive rate over the 1957 to 1968 period

through the process of import-substitution for which conditions were prevalent. The share of the primary sector in the Gross Domestic Product was reduced and its contribution to employment was also reduced. All indicators testified to the rapid rate of diversification. Instability in the economy was lowered considerably by the manufacturing sector which indicated only an upward trend in growth.

However, despite the achievement of the two main objectives which were specifically outlined, two other objectives which were assumed to be natural correlates of rapid industrial growth, namely, a lower level of unemployment and equitable distribution of income and wealth, were not fulfilled. In its contribution to employment, the sector lagged behind its contribution to G.D.P. while polarization of industry within the Klang valley region failed to provide the desired spread effects. The uneven spatial distribution of industrial growth was superimposed on existing differences in income and occupation along geographical and ethnic lines.

The planning procedure emphasised financial incentives to encourage rapid industrialization. Reliance was placed on the private investors to determine the nature of industry and its location. These two factors contributed to a capital-intensive industrial structure. Signs of excess capacity in a market constrained by domestic demand for import substitutes were brought about by the mushrooming of firms producing the same products. The domination of the sector by foreign

investors and by a small percentage of large establishments emerged.

The civil disturbances of May 1969 brought to the surface the weaknesses which underlined the rapid rate of economic growth. The thesis outlined the subsequent priorities in the objectives which were explicitly spelt out in the new economic policy embodied in the Second Malaysia Plan. An equitable distribution of wealth and income became the main objective of the new industrial policy. Various measures which were introduced to reduce economic imbalances between the Malays and the non Malays were outlined. The Government pursued a line of direct participation in industry to encourage industrialization in areas where economic gains are too limited to attract private investors. This move was also aimed at influencing employment policies of industries. Statuary bodies were set up to participate in industrial activity and to increase Malay participation in the sector. Regulations were imposed to ensure that employment in industry reflected the racial composition of the country's population. A twenty year perspective plan was outlined to restructure society so as to eliminate the identity of race with occupation. Targets were set on Bumiputra equity participation in industry. The decentralization of industry was stressed in order to bring about equitable regional distribution through the process of rural industrialization and propagation of small-scale resource-based industry. Promotion of export-oriented and labour-intensive industry and incentives for encouraging these types of industries

were spelt out. Emphasis on local content and priority projects were also specified. Less attractive areas were designated Development Areas to qualify for locational incentives which were introduced to attract private investors into these areas. While direct Government participation was emphasised, the role of private investment as a means of achieving rapid industrialization was stressed.

The performance of the manufacturing sector at the national and the district-level was assessed in the post-1969 period. A classification of the districts by the level of manufacturing attained in 1970 was attempted. The findings have been restricted by the sufficiency and the nature of the data available. Consequently the spatial pattern and the structure of manufacturing industry in the 1970s have been analysed on the basis of the industrial projects approved in the 1970 to mid 1974 period. The results were substantiated with the analysis of data on industry granted pioneer certificates until 1973.

An assessment of the performance and the trend of events in the five year period after the implementation of the new industrial policy against the objectives set out revealed significant changes in the location and the structure of the manufacturing industry. A progressive change from import-substitution to export-oriented industry was registered with the promotion of multinational component and assembly plants in the electrical and electronic industry. Rapid increases in wood-based industry, industry producing rubber products, textiles and clothing

also contributed to labour-intensive and export-oriented production. Industry using local content or local raw materials was shown to be still in a nascent stage of development.

A rapid rate of growth was achieved surpassing that of the pre-1969 period. Targets set for the growth of industry during the five-year period of the Second Malaysia Plan were achieved by 1973 in all three aspects: production, employment and exports. Changes in equity participation in favour of Malaysians were recorded, but in industry which was export-oriented the majority ownership remained foreign. With the development of labour-intensive industry, the capital-labour ratio declined slightly although within specific industry types especially the petroleum industry and in some regions like the Klang Valley and Port Dickson, it was higher than the overall average.

State Development Corporations and public Corporations have been successful in achieving a higher share of Bumiputra participation in employment particularly in the higher level occupational categories.

Decentralization of industry intraregionally within the Klang Valley region and interregionally to Penang and Johore Bahru had taken place. New industrial plants favoured locations in the urban-rural fringe areas of existing urban-industrial centres, within the same districts or in adjacent districts. Dispersion of industry into west coast districts was overwhelmingly evident. But dispersion was more apparent than real. It was a centripetal process of industrial growth

converting regional industrial centres into industrial belts similar to a pattern depicted in the Klang Valley region.

A separate assessment of industrial decentralization into the designated Development Areas cast doubts on the ability of the outlined locational incentives to act as a significant "pull" to attract industry into these areas.

The creation of industrial estates and free trade zones in close proximity to existing industrial areas and within the spheres of influence of major urban centres in the west coast districts and in Development Areas and the provision of locationally indiscriminate financial incentives run counter to the objective of decentralising industry to achieve equitable regional development. In this context too, the lack of clarity on the precise motives of providing financial incentives to industrialists, existed. Are financial incentives geared to attract local and foreign investors into investing in the manufacturing sector of West Malaysia? Or are financial incentives designed to serve as locational incentives to compensate for the less attractive environment?

A definite gap between social objectives and actual performance in terms of the reduction of regional inequality led to the second aim of this thesis, namely, the assessment of the factors that determine the location of industries. A three dimensional approach was taken to evaluate the major determinants of industrial location in this developing country where public policy is both a

cause and a consequence[1] of industrial development.

At the micro-level, since the firm and its decision-making is the basic component of the regional industrial pattern, attention was focused on the behaviour of the firm in understanding the processes of industrial location. A factor classification was drawn up. The entrepreneur's evaluation of the advantages of the industrial environment that have permitted growth emphasised the importance of five factors. Nearness to seaport, low labour cost, power, administrative linkage (cooperation of the State Development Corporations) and centrality to markets were the major factors outlined. The advantages of these factors were stressed by entrepreneurs regardless of the employment size of plants, amount and ownership of capital invested, nature of raw materials and markets and the nature of products manufactured.

Associated with the locational advantages of industrial sites are the motives for investment in industrial projects in West Malaysia. The derived motives for investing in industry reflected the problem-solving approach to investment adopted by foreign investors. Political stability, suitability of the investment climate, favourable policy regulations on profits and security of investment were cited as the most advantageous factors that motivated investors. The need to overcome restrictions and obstacles in their own countries were also quoted as reasons for investing abroad. Tax incentives were rated as less important and emerged as inducements

---

1. Smith, D.M., op.cit., p. 438.

of marginal importance to the investment decisions of foreign investors. However, tax incentives were considered a positive inducement by local investors.

A second assessment of the factors determining industrial location was undertaken using the macro-level approach. Districts were systematically classified according to their socio-economic structure and acquired industrial assistance. The relationships between the level of manufacturing attained by the districts and their socio-economic characteristics were analysed. Whilst the relationship revealed a certain degree of circularity and cause-effect influence, a high level of manufacturing was locationally correlated with districts which have large urban centres, a high per capita income, a diversified non-agricultural employment structure and population in-migration. Industrialization in these districts was shown to be aided by industrial assistance in the form of physical and fiscal incentives and the availability of financial institutions. The analysis confirmed that socio-economic disparities existed both at the intra-state and inter-state levels. The index of State-level variations in income differentials, weighted by the population distribution, amounted to 0.36 in 1970, while the index of district-level income differentials amounted to 0.43.

Corresponding to the highest level on the overall socio-economic scale and implemented industrial policy measures, the highest level of manufacturing was achieved by the Kuala Lumpur district. Districts which were low on the socio-economic scale had a correspondingly low level of manufacturing. It was shown in the analysis

that industrial policy measures were most effective in districts with a comparatively high socio-economic status. Districts that had a higher level of manufacturing relative to their socio-economic position because of industrial assistance failed to achieve a high rank on the level of manufacturing in comparison to other districts. These findings also showed clearly the association between large urban centres and industrial development. The importance of regional socio-economic characteristics as a precondition to industrial decentralization was shown in this analysis. Its validity was suggested by the dispersion of industrial projects approved in the 1970 to mid 1974 period into districts which were underachievers on the level of manufacturing relative to their socio-economic conditions in 1970.

To provide further insight into, and to confirm the factors determining industrial location, derived from the earlier approaches, an analysis of commodity flow patterns was carried out. The analysis confirmed that production of manufactured goods which enter into inter-regional or nationally-based flow patterns is concentrated in the Klang Valley region (Kuala Lumpur and Klang) and the three other major urban centres of Penang, Johore Bahru and Ipoh. These urban centres also constituted the major markets for the nationally-based commodity flows. Apart from resource-based manufactured products whose production centres are predominantly market-oriented, in the remaining nationally-based commodity groups, coexistence of markets and supply areas of local and imported

materials, inputs and machinery, eliminates the distinction between market-oriented or material-oriented production. Manufacturing plants in the major urban centres capitalise on this coexistence and the advantages of urban agglomeration.

In the 'local traffic' or intraregional commodity flow patterns, production is dispersed to a large number of subregional centres with short hauls to their immediate zones of influence. The lower level of consumer non-durable products, grain and manufactured grain products and bulky manufactured products demonstrated this pattern of production and distribution.

To complete the analysis and to determine the regional complementarity in industrial production and inter-industry linkages, commodity interflows between zones were analysed. The dominance of Kuala Lumpur with respect to the other major urban centres was indicated in the patterns of spatially mutual interactions. The concentration of production of manufactured goods in the major urban centres was shown to be based on the alternative strategy of import-substitution or export-orientation. As such the importance of these centres in the open dualistic economy is further entrenched. They operate as a mixture of market-area and supply-area systems in spatially mutual interrelationships. Intense interactions among the major urban centres produce a superstructure of interactions which confirmed the importance of urban and economic factors in the location of industry and the economies of urban agglomeration in nationally-oriented production.

Finally, the application of these findings cannot be ignored. The study of the determinants of industrial location have been linked with the policy question on spatial planning programmes to achieve development in line with social and economic objectives which aim at reducing regional disparities. The analysis of the relationships between the level of manufacturing and the socio-economic structure, and the analysis of commodity flow patterns demonstrated a strategy of growth focused on regional centres and subcentres. From this, a spatial policy was tentatively suggested for the development at the national level of an urban strategy consisting of an integrated system of regional centres. This would facilitate a rational distribution of investments and a rational distribution of development radiating from the growth centres into the surrounding areas.

Incorporated into this strategy of development is the issue of measures to be adopted to promote industrial decentralization. Since industrial incentives have been instrumental in encouraging decentralization of industry, industrial disincentives have been suggested in areas of industrial polarization to function as diseconcmies of agglomeration. It would be hoped that industry could be diverted to regional centres outside the Klang Valley region. It was shown that tax incentives are of marginal importance in influencing the industrialists' decisions to invest in West Malaysia, therefore, it was been suggested that tax incentives could be more effectively applied as locational incentives in Development Areas.

APPENDIX A3.1

THE MALAYSIAN INDUSTRIAL CLASSIFICATION

The Malaysian Industrial Classification (MIC) is made up of four levels. The division level (one digit) divides all economic activity into ten broad categories. Manufacturing being Division 3 and 4. The major group levels (two digit) subdivide the division level into narrow categories. Within the manufacturing division there are twenty major groups. These are: Food manufacturing industry (30); Beverages (31); Tobacco products (32); Textiles (33); Manufacturing of furniture, except rubber footwear, other wearing apparel, and made up textile goods (34); manufacture of wood, rattan, mengkuang, attap and cork products, except furniture and footwear (35); manufacture of furniture and fixtures (36); manufacture of paper and paper products (37); printing and publishing and allied industries (38); manufacture of leather, fur and leather products, except footwear and wearing apparel (39); manufacture of rubber products (40); manufacture of chemicals (41); manufacture of products of petroleum and coal (42); manufacture of non-metallic mineral products, except petroleum and coal products (43); basic metal industries (44); manufacture of metal products except machinery and transport equipment (45); manufacture of machinery, except electrical machinery (46); manufacture of electrical machinery, apparatus, appliances and supplies (47); manufacture of transport equipment (48); miscellaneous manufacture

industries (49). The twenty-first category being agriculture products requiring substantial processing (11).

The third digit further subdivides the major manufacturing groups into finer detail, for example, Beverages (31) are divided into (311) distilling and blending of spirits; (312) wine manufacture; (313) breweries; (314) soft drinks and carbonated beverages.

The fourth digit subdivides the group into individual industries,[1] for example, Biscuits(3061) and Bakeries (3062) and so on.

The number of individual industries increase with time but taking the 1968 Manufacturing Census as the bench mark year for the first phase of industrialization in West Malaysia, a total of one hundred and seventy nine different industrial activities were known to exist.

1. Dept. of Statistics, Census of Manufacturing Industries, West Malaysia 1968, p. 12.

APPENDIX A3.2

FIVE CATEGORIES OF INDUSTRIAL ACTIVITIES

For clarity and ease of handling, the profile of one hundred and seventy nine manufacturing activities have been sub-divided into five major categories of activities. The classification is based on the nature of the products, their use and the production techniques employed. Although the categorization is arbitrary and perhaps subjective it has been undertaken with considerations for the Malaysian context.

The five categories are as follows:

1. Elementary Resource-based Industry
2. Advanced Resource-based Industry
3. Consumer Industry
4. Intermediate Industry
5. Capital Goods Industry.

Resource-based industry is deliberately sub-divided into two categories. Elementary resource-based industry can be defined as simple processing to enable an agricultural or mineral product to be exported as a primary export commodity. Rubber and copra are two examples. It also includes simple processing of agricultural foodstuffs such as rice, tea and coffee. It includes grain-milling, firewood making, rattan and attap processing into simple products. The value added by this category of industry is minimal.[1]

---

1. Hischman, A.O., refers to this category as "satellite" industries of the corresponding primary industries, enjoying strong locational advantages from proximity

Continued over.

28 The term 'advanced resource-based industry' intends to imply vertical integration of manufacturing activities, detached from but dependent on the domestic land-based raw materials. The technology involved is relatively more sophisticated and this category reflects a greater increase in value added to local resources,[1] with some backward and forward linkages within the existing industry. The manufacturing activities classified as such include a wide range of activities associated with forestry, rubber industry, canning and preserving of fruits, meat and sea foods.

Consumer industry needs no elaboration as it refers to all consumer non-durable products. Intermediate industry includes manufacturing activities whose output is intermediate to final demand or forms an industrial raw material of another manufacturing process. Capital goods industry refers to machinery, heavy equipment and electrical products and repair works.

The individual manufacturing activities are shown in table A3.9.

Footnote continued from previous page.

to the master industry and using principal inputs and outputs or by-products of the master industry without subjecting it to elaborate transformation. See Hirschman, A.O., The Strategy of Economic Development, Yale University Press, 1959.

1. In support of the statement above it can be shown that the f.o.b. unit value ($ per ton) for round timber in 1968 was 77 while that of sawn timber was 191 and for plywood, 143 per sq. feet.
Extracted from: Malaysia, Second Malaysia Plan 1971-75, Government Press, Kuala Lumpur, 1971, p. 22-23.

Appendix Table A3.3. WEST MALAYSIAN GROSS DOMESTIC PRODUCT BY SECTORS
$ (million) IN CURRENT PRICES AT FACTOR COST 1957 to 1974

Year	Agriculture Forestry, Hunting & Fishing	%	Mining & Quarrying	%	Manu-facturing	%	Con-struction	%	Mining, Quarrying & Con-struction	%	Electricity Water, Sanitary Service	%	All Other Services	%	All services including Electricity, water, sani-tary services	%	Gross Domestic Product	%
1957	1567	36.83	275	6.46	359	8.44	115	2.70	390	9.16	63	1.48	1875	44.07	1938	45.55	4254	100.00
1958	1531	36.77	190	4.56	363	8.71	113	2.71	303	7.27	53	1.27	1913	45.95	1966	47.22	4163	100.00
1959	1806	38.99	215	4.64	415	8.96	120	2.59	335	7.23	54	1.16	2021	43.64	2075	44.80	4631	100.00
1960	1963	37.77	306	5.88	452	8.69	158	3.04	464	8.92	70	1.34	2248	43.25	2318	44.59	5197	100.00
1961	1842	34.96	381	7.23	428	8.12	191	3.62	572	10.85	78	1.48	2348	44.57	2426	46.05	5268	100.00
1962	1825	33.20	391	7.11	472	8.58	240	4.36	631	11.47	86	1.56	2482	45.16	2568	46.72	5496	100.00
1963	1847	31.50	419	7.14	533	9.09	274	4.67	693	11.81	98	1.67	2691	45.90	2789	47.57	5862	100.00
1964	1848	29.54	502	8.02	652	10.42	289	4.62	791	12.64	112	1.79	2852	45.59	2964	47.38	6255	100.00
1965	1956	28.57	598	8.73	701	10.24	315	4.60	913	13.33	131	1.91	3143	45.92	3274	47.83	6844	100.00
1966	2220	31.97	609	8.77	750	10.80	274	3.94	883	12.71	171	2.46	2919	42.04	3090	44.50	6943	100.00
1967	2269	31.31	627	8.65	861	11.88	289	3.98	916	12.63	185	2.55	3014	41.60	3199	44.15	7245	100.00
1968	2481	32.23	645	8.37	946	12.29	308	4.00	953	12.37	194	2.52	3123	40.57	3317	43.09	7697	100.00
1969	2704	33.46	623	7.70	1007	12.46	318	3.93	941	11.63	205	2.53	3224	39.89	3429	42.42	8081	100.00
1970	2428	29.07	548	6.56	1254	15.01	290	3.47	838	10.03	221	2.64	3611	43.23	3832	45.87	8352	100.00
1971	2450	28.05	NA	-	1366	15.64	NA	-	821	9.40	NA	-	NA	-	4098	46.91	8735	100.00
1972	2359	24.96	NA	-	1570	16.62	NA	-	877	9.28	NA	-	NA	-	4643	49.13	9450	100.00
1973	3658	30.59	NA	-	2026	16.94	NA	-	1002	8.38	NA	-	NA	-	5270	44.08	11957	100.00
1974	4258	30.27	NA	-	2674	19.01	NA	-	1326	9.43	NA	-	NA	-	5806	41.28	14066	100.00

Appendix Table A3.3a. INDICES OF GROWTH OF EACH SECTOR AND THE G.D.P. IN CURRENT PRICES AT FACTOR COST

1957-1974 (BASE YEAR = 1957)

Year	Agri-culture	Mining & Construc-tion	Manu-facturing	All other services	Gross Domestic Product
1957	100.0	100.00	100.00	100.00	100.00
1958	97.70	77.69	101.11	101.44	97.86
1959	115.25	85.90	115.60	107.07	108.86
1960	125.27	118.97	125.91	119.61	122.17
1961	117.55	146.67	119.22	125.18	123.84
1962	116.47	161.79	131.48	132.51	129.20
1963	117.87	177.69	148.47	143.91	137.80
1964	117.93	202.82	181.62	152.94	147.04
1965	124.83	234.10	195.27	168.94	160.88
1966	141.67	226.41	208.91	159.44	163.21
1967	144.80	234.87	239.83	165.07	170.31
1968	158.38	244.36	263.50	171.16	180.94
1969	172.56	241.28	280.50	176.93	189.96
1970	155.95	214.87	349.30	197.73	196.33
1971	156.35	210.51	380.50	211.46	205.34
1972	150.54	224.87	437.60	239.58	222.14
1973	233.44	256.92	563.35	271.93	281.08
1974	303.64	340.00	744.85	299.59	330.65

Appendix Table A3.3b. INDICES OF GROWTH IN REAL VALUE OF EACH SECTOR AND G.D.P. AT FACTOR COST

(Constant Price = 1967 Price)

Year	Agri-culture	Mining & Construc-tion	Manu-facturing	All other services	Gross Domestic Product	Price Index
1957	100.00	100.00	100.00	100.00	100.00	
1958	97.70	77.69	101.11	101.44	97.86	
1959	115.25	85.90	115.60	107.07	108.86	
1960	125.27	118.97	125.91	119.61	122.17	
1961	117.55	146.67	119.22	125.18	123.84	
1962	116.47	161.79	131.48	132.51	129.20	
1963	117.87	177.69	148.47	143.91	137.80	
1964	117.93	202.82	181.62	152.94	147.04	
1965	124.83	234.10	195.27	168.94	160.88	
1966	141.67	226.41	208.91	159.44	163.21	
1967	144.80	234.87	239.83	165.07	170.31	100.00
1968	158.70	244.85	264.03	171.50	181.30	99.80
1969	173.60	242.74	282.19	178.00	191.11	99.40
1970	153.95	212.11	344.82	195.19	193.81	101.30
1971	151.94	204.58	369.78	205.50	199.55	102.90
1972	141.75	211.74	412.05	225.59	209.17	106.20
1973	198.84	218.84	479.86	231.63	239.42	117.40
1974	219.23	245.49	537.80	216.31	238.74	138.50

Note: As the rate of price increase up to 1967 was below 1 per cent per annum no adjustments are made. Sector values and G.D.P. at current prices and real value are taken to be the same.

Appendix Table A 3.4 WEST MALAYSIA: EMPLOYMENT BY INDUSTRY SECTORS

Industry	1957 (000) Male	Female	Total	Per cent	1962 (000) Male	Female	Total	Percent	1967/68 (000) Male	Female	Total	Per cent
I. Agriculture, Forestry, Hunting and Fishing	413.0	159.8	572.8	26.94	299.9	189.2	489.1	21.21	332.6	188.7	521.3	21.34
2. Agricultural Products requiring processing	430.5	241.5	672.0	31.61	478.3	294.7	772.9	33.53	436.7	317.4	754.2	30.86
3. Mining and Quarrying	49.0	9.5	58.5	2.75	38.5	7.1	45.6	1.98	59.7	7.8	67.4	2.76
4. Manufacturing	112.9	22.5	135.7	6.37	107.8	48.9	156.8	6.80	150.2	58.3	208.6	8.54
5. Construction	62.4	5.3	67.8	3.20	42.6	4.1	46.7	2.02	76.7	7.2	83.9	3.43
6. Electricity, gas, water and sanitary services	11.1	0.4	11.5	0.54	8.2	0.1	8.4	0.36	17.4	0.3	17.7	0.73
7. Commerce	176.6	18.6	195.2	9.18	263.4	47.7	311.2	13.50	211.3	48.4	259.6	10.62
8. Transport, Storage and Communications	75.3	1.5	74.8	3.52	75.7	2.2	77.9	3.38	91.9	2.6	94.5	3.87
9. Services	258.7	61.0	319.7	15.04	289.9	105.4	395.3	17.14	294.5	136.6	431.1	17.64
10. Industry not specified	15.0	3.1	18.1	0.85	0.7	1.1	1.9	0.08	4.5	0.7	5.2	0.21
Total	1602.9	523.2	2126.2	100.00	1605.2	700.6	2305.7	100.00	1675.4	768.1	2443.5	100.00

Source: 1957 data are extracted from the Population Census Report Vol. 14 p.31.
1962 data areextracted from Sample Survey of Employment, Unemployment, West Malaysia 1962.
1967 data are extracted from Malaysian Socio-economic Sample Survey of Households,1967/68.

Appendix A3:5

METHODOLOGICAL NOTES ON THE COMPILATION OF A LIST OF MANUFACTURING ESTABLISHMENTS BY LOCATION, SIZE AND INDUSTRIAL ACTIVITY, 1968

The three volumes of the Directory of Manufacturing Establishments published in 1970 provides a list of the names and addresses of all manufacturing establishments operating in West Malaysia in 1968 - broken down by a State code, the four digit level MIC code and by a code denoting employment size. Using the addresses of the manufacturing establishments as a guide, the 9084 factories were recoded according to a district-level code while maintaining the information on the MIC and the employment size groups.

Apart from the mammoth size of the task, this exercise presented certain problems. A percentage of industrial establishments were addressed not on the basis of their actual location but according to the mailing addresses of the managing directors, partners or proprietors. Others were addressed by the company's headquarters. In such cases additional information had to be obtained from the companies, partners or proprietors regarding the precise district-level site of the factory, before the information for that industrial establishment could be coded and punched on cards. This slowed down the process somewhat, although the information was readily available. The computer was then used to obtain the cross-tabulations on the three indicators, location, employment size and industrial activity.

It is important to note that the total number of operational establishments arrived at, using the addresses of the manufacturing units as a guide, amounted to 9084. The Census of Manufacturing 1968 quotes the total number as 9016. Thus an error of 0.8 per cent was encountered due to double counting.

Appendix A 3.6. DISTRICT-LEVEL DISTRIBUTION OF INDUSTRIAL ESTABLISHMENTS OF DIFFERENT EMPLOYMENT SIZES, 1968

District	All establishments		No Full-time paid employment		1-19 F.T. Empl.		20-49 F.T. Empl.		50-99 F.T. Empl.		100+ F.T. Empl.	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Batu Pahat	212	2.33	82	2.48	106	2.37	15	2.02	5	1.66	4	1.50
Johore Bahru	363	4.00	87	2.63	182	4.08	42	5.65	20	6.62	32	11.99
Kluang	126	1.39	55	1.66	57	1.28	6	0.81	3	0.99	5	1.87
Kota Tinggi	28	0.31	15	0.45	9	0.20	3	0.40	1	0.33	-	-
Mersing	28	0.31	12	0.36	8	0.18	5	0.67	3	0.99	-	-
Muar	214	2.36	108	3.27	93	2.08	8	1.08	3	0.99	2	0.75
Pontian	73	0.80	32	0.97	30	0.67	5	0.67	2	0.66	4	1.50
Segamat	89	0.98	37	1.12	44	0.99	5	0.67	1	0.33	2	0.75
Yen	18	0.20	8	1.19	10	0.22	-	-	-	-	-	-
Baling	29	0.32	16	0.48	9	0.20	3	0.40	-	-	1	0.37
Bandar Bahru	10	0.11	6	0.18	4	0.09	-	-	-	-	-	-
Kota Star	332	3.65	108	3.27	188	4.21	28	3.77	8	2.65	-	-
Kota Muda	168	1.85	69	2.09	83	1.86	9	1.21	3	0.99	4	1.50
Kubang Pasu	104	1.14	59	1.78	38	0.85	7	0.94	-	-	-	-
Kulim	84	0.93	37	1.12	39	0.87	3	0.40	3	0.99	2	0.75
Langkawi	11	0.12	5	0.15	4	0.09	2	0.27	-	-	-	-
Padang Terap	2	0.02	-	-	2	0.04	-	-	-	-	-	-
Sik	5	0.04	2	0.06	2	0.04	-	-	1	0.33	-	-
Bachok	12	0.13	6	0.18	5	0.11	1	0.13	-	-	-	-
Kota Bahru	220	2.42	82	2.48	117	2.62	10	1.35	5	1.61	6	2.25
Machang	11	0.12	8	1.19	3	0.07	-	-	-	-	-	-
Pasir Mas	33	0.36	13	0.39	17	0.38	3	0.40	-	-	-	-
Pasir Putih	33	0.36	15	0.45	18	0.40	-	-	-	-	-	-
Tanah Merah	6	0.06	4	0.12	2	0.04	-	-	-	-	-	-
Tumpat	32	0.35	25	0.76	6	0.13	1	0.13	-	-	-	-
Ulu Kelantan	13	0.14	6	0.18	5	0.11	1	0.13	1	0.33	-	-
Alor Gajah	47	0.52	26	0.79	19	0.43	1	0.13	1	0.33	-	-
Jasin	25	0.28	15	0.45	8	0.18	1	0.13	-	-	1	0.37
Malacca Central	335	3.69	121	3.66	186	4.17	21	2.83	2	0.66	5	1.87
Jelebu	4	0.04	1	0.03	2	0.04	1	0.13	-	-	-	-
Kuala Pilah	74	0.82	35	1.06	35	0.78	1	0.13	2	0.66	1	0.37
Port Dickson	30	0.53	11	0.33	12	0.27	3	0.40	1	0.33	3	1.12
Rembau	10	0.10	3	0.09	4	0.09	2	0.27	1	0.33	-	-
Seremban	251	2.76	84	2.54	130	2.91	30	4.04	1	0.33	6	2.25
Tampin	31	0.34	20	0.61	7	0.16	-	-	3	0.99	1	0.37
Bentong	62	0.68	30	0.91	26	0.58	4	0.54	1	0.33	1	0.37
Cameron Highlands	3	0.03	2	0.06	1	0.02	-	-	-	-	-	-
Jerantut	29	0.32	19	0.58	4	0.09	3	0.40	3	0.99	-	-
Kuantan	119	1.31	37	1.12	63	1.41	10	1.35	6	1.99	3	1.12
Lipis	25	0.28	18	0.54	5	0.11	-	-	1	0.33	1	0.37
Pekan	28	0.31	19	0.58	5	0.11	2	0.27	2	0.66	-	-
Raub	58	0.64	25	0.76	26	0.58	3	0.40	2	0.66	2	0.75
Temeloh	89	0.98	63	1.91	15	0.34	5	0.67	5	1.66	1	0.37
Bukit Mertajam	169	1.86	65	1.97	82	1.84	11	1.48	4	1.32	7	4.19
Butterworth	289	3.18	75	2.27	171	3.83	28	3.77	5	1.66	10	3.75
Nibong Tebal	66	0.73	31	0.94	31	0.69	2	0.27	-	-	2	0.75
Penang N.E.	812	9.05	343	10.37	401	8.98	39	5.25	17	5.63	12	4.49
Penang S.W.	25	0.28	13	0.39	12	0.27	-	-	-	-	-	-
Batang Padang	91	1.00	60	1.81	26	0.58	4	0.54	1	0.33	-	-
Dindings	91	1.00	50	1.51	36	0.81	2	0.27	3	0.99	2	0.75
Kinta	911	10.05	285	8.62	482	10.80	86	11.57	39	12.91	19	7.12
Krian	94	1.03	37	1.12	54	1.21	2	0.27	1	0.33	-	-
Kuala Kangsar	133	1.46	73	2.21	56	1.25	3	0.40	-	-	1	0.37
Larut/Matang	195	2.15	54	1.63	116	2.60	14	1.88	3	0.99	8	3.00
Lower Perak	163	1.79	58	1.75	89	1.99	13	1.75	2	0.66	1	0.37
Upper Perak	25	0.28	16	0.48	8	0.18	1	0.13	-	-	-	-
Perlis	83	0.91	22	0.67	57	1.28	4	0.54	-	-	-	-
Klang	233	2.57	64	1.94	131	2.93	12	1.62	8	2.65	18	6.74
Kuala Langat	62	0.68	39	1.18	20	0.45	2	0.27	-	-	1	0.37
Kuala Lumpur	1631	17.96	304	9.19	866	19.40	253	34.05	117	38.74	91	34.08
Kuala Selangor	58	0.64	24	0.73	29	0.65	2	0.27	2	0.66	1	0.37
Sabak Bernam	27	0.30	10	0.30	15	0.34	1	0.13	1	0.33	-	-
Ulu Langat	92	1.01	51	1.54	32	0.72	5	0.67	3	0.99	1	0.37
Ulu Selangor	67	0.74	35	1.06	25	0.56	4	0.54	1	0.33	2	0.75
Besut	49	0.54	20	0.61	26	0.58	3	0.40	-	-	-	-
Dungun	22	0.24	13	0.39	6	0.13	1	0.13	2	0.66	-	-
Kenaman	21	0.23	8	0.24	10	0.22	1	0.13	2	0.66	-	-
Kuala Trengganu	178	1.96	113	3.42	53	1.19	5	0.67	3	0099	4	1.50
Marang	5	0.01	3	0.09	2	0.04	-	-	-	-	-	-
Ulu Trengganu	16	0.18	15	0.45	-	-	1	0.13	-	-	-	-
Total	9084	100.0	3307	100	4465	100	743	100	302	100	267	100
% of total establishments		100	36.41		49.15		8.18		3.32		2.94	

F.T.Empl. = Full-time paid employment.

Appendix Table A 3.7. A BREAKDOWN OF DISTRICT'S MANUFACTURING ESTABLISHMENTS BY EMPLOYMENT SIZE, 1968 (PERCENTAGES)

Name of District	Manufacturing plants with No F.T.P. Empl.	1-19 F.T.P. Empl.	20-49 F.T.P. Empl.	50-99 F.T.P. Empl.	100+ F.T.P. Empl.
Batu Pahat	38.7	50.0	7.0	2.4	1.9
Johore Bahru	24.0	50.1	11.6	5.5	8.8
Kluang	43.7	45.2	4.8	2.4	4.0
Kota Tinggi	53.6	32.1	10.7	3.6	-
Mersing	42.9	28.6	17.9	10.7	-
Muar	50.5	43.5	3.7	1.4	0.9
Pontian	43.8	41.1	6.8	2.7	5.5
Segamat	41.6	49.4	5.6	1.1	2.2
Yen	44.5	55.6	-	-	-
Baling	55.2	31.0	10.3	-	3.4
Bandar Bahru	60.0	40.0	-	-	-
Kota Star	32.5	56.6	8.4	2.4	-
Kuala Muda	41.1	49.4	5.4	1.8	2.4
Kubang Pasu	56.7	36.5	6.7	-	-
Kulim	44.0	46.4	3.6	3.6	2.4
Langawi	45.5	36.4	1.8	-	-
Padang Terap	-	100.0	-	-	-
Sik	40.0	40.0	-	10.0	-
Bachok	50.0	41.7	8.3	-	-
Kota Bahru	37.3	53.2	4.5	2.3	2.7
Machang	72.7	27.3	-	-	-
Pasir Mas	39.4	51.5	9.1	-	-
Pasir Putih	45.5	54.5	-	-	-
Taneh Merah	66.7	33.3	-	-	-
Tumpat	78.1	18.8	3.1	-	-
Ulu Kelantan	46.2	38.5	7.7	7.7	-
Alor Gajah	55.3	40.4	2.1	2.1	-
Jasin	60.0	32.0	4.0	-	4.0
Malacca Central	36.1	55.5	6.3	0.6	1.5
Jelebu	25.0	50.0	25.0	-	-
Kuala Pilah	47.3	47.3	1.4	2.7	1.4
Port Dickson	36.7	40.0	10.0	3.3	10.0
Rembau	30.0	40.0	20.0	10.0	-
Seremban	33.5	51.8	12.0	0.4	2.4
Tampin	64.5	22.6	-	9.7	3.2
Bentong	48.4	41.9	6.5	1.6	1.6
Cameron Highlands	66.7	33.3	-	-	-

Name of District	Manufacturing plants with No F.T.P. Empl.	1-19 F.T.P. Empl.	20-49 F.T.P. Empl.	50-99 F.T.P. Empl.	100+ F.T.P. Empl.
Jerantut	66.5	13.8	10.3	10.3	-
Kuantan	31.1	52.9	8.4	5.0	2.5
Lipis	72.0	20.0	-	4.0	4.0
Pekan	67.9	17.9	7.1	7.1	-
Raub	43.1	44.8	5.2	3.4	3.4
Termeloh	70.8	16.8	5.6	5.6	1.1
Bukit Mertajam	38.5	48.5	6.5	2.4	4.1
Butterworth	26.0	59.2	9.7	1.7	3.4
Nibong Tebal	47.0	47.0	3.0	-	3.0
Penang N.E.	42.2	49.4	4.8	2.1	1.5
Penang S.W.	52.0	48.0	-	-	-
Batang Padang	65.9	28.6	4.4	1.1	-
Dindings	55.0	39.6	2.2	1.0	2.2
Kinta	31.3	52.9	9.4	4.3	2.1
Krian	39.4	57.5	2.1	1.0	-
Kuala Kangsar	54.9	42.1	2.3	-	0.7
Larut/Matang	27.7	59.5	7.2	1.5	4.1
Lower Perak	35.6	54.6	8.0	1.2	0.6
Upper Perak	64.0	32.0	4.0	-	-
Perlis	26.5	69.7	4.8	-	-
Klang	27.5	56.2	5.2	3.4	7.7
Kuala Langat	62.9	32.3	3.2	-	1.6
Kuala Lumpur	18.6	53.1	15.5	7.2	5.6
Kuala Selangor	41.4	50.0	3.5	3.4	1.7
Sabak Bernam	37.0	55.6	3.7	3.7	-
Ulu Langat	55.4	34.8	5.4	3.3	1.1
Ulu Selangor	52.2	37.3	6.0	1.5	3.0
Besut	40.8	53.1	16.1	-	-
Dungun	59.1	27.3	4.6	9.0	-
Kenaman	38.1	47.6	4.8	9.5	-
Kuala Trengganu	63.5	29.8	2.8	1.7	2.2
Marang	60.0	40.0	-	-	-
Ulu Trengganu	93.8	-	6.2	-	-

F.T.P. Empl. = Full-time paid employment.

Appendix Table A 3.8. DISTRICT-LEVEL DISTRIBUTION OF ESTABLISHMENTS ACCORDING TO BROAD INDUSTRY GROUPS

District	No. of Activities	(1) No.	(1) %	(2) No.	(2) %	(3) No.	(3) %	(4) No.	(4) %	(5) No.	(5) %
Kuala Lumpur	149	125	7.7	121	7.4	680	41.7	173	10.6	532	32.6
Penang N.E.	116	60	7.8	107	13.4	377	46.6	64	7.9	204	25.6
Kinta	111	110	12.1	61	6.7	343	37.7	96	10.5	301	33.0
Johore Bahru	105	30	8.3	29	8.0	162	44.6	41	11.3	101	27.8
Butterworth	82	60	20.8	23	8.0	86	29.8	35	12.1	85	29.4
Malacca Central	81	44	13.1	23	6.9	150	44.8	29	8.7	89	26.6
Klang	80	22	9.4	23	9.9	96	41.2	19	8.2	73	31.3
Seremban	70	43	17.1	15	6.0	95	37.8	17	6.8	81	32.3
Larut/Matang	63	40	20.5	13	6.7	87	44.6	18	9.2	37	19.0
Bukit Mertajam	62	63	37.3	11	6.5	49	29.0	18	10.7	28	16.6
Batu Pahat	61	54	25.5	19	9.0	84	39.6	6	2.8	49	23.1
Muar	60	47	22.0	20	9.3	79	36.9	10	4.7	58	27.1
Kuala Muda	54	59	35.5	13	7.7	60	35.5	6	3.6	30	17.8
Kota Bahru	52	66	30.0	7	3.2	103	46.8	5	2.3	39	17.7
Kluang	51	10	7.9	16	12.7	49	38.9	5	4.0	46	36.5
Kota Star	48	176	53.0	20	6.0	76	22.5	7	2.1	53	16.0
Lower Perak	48	38	23.3	12	7.4	65	39.9	7	4.3	41	25.2
Kuantan	44	25	21.0	17	14.3	41	34.5	5	4.2	31	26.1
Kuala Trengganu	42	100	56.2	4	2.2	38	21.3	3	1.7	33	18.5
Kuala Kangsar	37	46	34.6	6	4.5	5	33.8	3	2.3	33	24.8
Pontian	37	14	19.2	6	8.2	24	32.9	3	4.7	26	27.1
Ulu Langat	36	11	12.0	7	7.6	30	32.6	5	5.4	39	42.4
Batang Padang	34	17	18.7	7	7.7	29	31.9	5	5.5	33	36.3
Kulim	34	22	26.2	7	8.3	31	36.9	3	3.6	21	25.0
Segamat	34	11	12.4	5	5.6	35	39.3	4	4.5	33	37.1
Nibong Tebal	30	21	31.8	11	16.7	20	30.3	4	6.1	10	15.2
Dindings	29	29	31.9	4	4.4	26	28.6	4	4.4	28	30.8
Ulu Selangor	28	19	28.4	1	1.5	19	28.4	6	9.0	22	32.8
Krian	25	60	63.8	6	6.4	13	13.8	3	3.2	12	12.8
Kuala Pilah	25	26	35.1	1	1.4	20	27.0	4	5.4	23	31.1
Alor Gajah	24	9	19.1	6	12.8	18	38.3	1	2.1	13	27.7
Kuala Selangor	24	18	31.0	2	3.4	13	22.4	2	3.4	23	39.7
Bentong	23	25	40.3	9	14.5	14	22.6	1	1.6	13	21.0
Kuala Langat	23	22	35.5	10	16.1	10	16.1	3	4.8	7	27.4
Termeloh	22	63	70.8	3	3.4	9	10.1	4	4.5	10	11.2
Raub	20	27	46.6	2	3.4	19	32.8	-	-	10	17.2
Perlis	19	54	65.1	2	2.4	19	22.9	1	1.2	17	8.4
Tampin	18	8	25.8	1	3.2	12	38.7	1	3.2	9	29.0
Port Dickson	16	2	6.7	3	10.0	6	20.0	8	26.7	10	33.3
Kubang Pasu	15	86	82.7	-	-	9	8.7	-	-	9	8.7
Mersing	14	4	14.3	3	10.7	8	28.6	-	-	13	46.4
Penang S.W.	14	7	28.0	4	16.0	8	32.0	1	4.0	5	20.0
Sabak Bernam	14	14	51.9	3	11.1	6	22.2	-	-	4	14.8
K. Tinggi	13	5	17.9	3	10.7	10	35.7	1	3.6	9	32.1
Jasin	13	10	40.0	1	4.0	6	24.0	1	4.0	7	28.0
Dungun	12	6	27.3	3	13.6	9	40.9	-	-	4	18.2
Upper Perak	12	12	48.0	1	4.0	6	24.0	-	-	6	24.0
Baling	11	17	58.6	1	3.4	6	20.7	1	3.4	4	13.8
Pekan	11	17	60.7	1	3.6	8	28.6	-	-	2	7.1
Kemaman	11	6	28.6	4	19.0	7	33.3	-	-	4	19.0
Pasir Mas	10	25	75.8	1	3.0	6	18.2	-	-	1	3.0
Tumpat	10	22	68.8	-	-	6	18.8	1	3.1	3	9.4
Lipis	10	15	60.0	2	8.0	7	28.0	-	-	1	4.0
Jerantut	8	18	62.1	1	3.4	5	17.2	2	6.9	3	10.3
Ulu Kelantan	7	5	38.5	-	-	6	46.2	-	-	2	15.4
Yen	6	14	77.8	1	5.6	-	-	-	-	3	16.7
Langkawi	6	7	63.6	1	9.1	3	27.3	-	-	-	-
Machang	6	8	66.7	1	8.3	1	8.3	-	-	1	8.3
Pasir Puteh	6	28	84.8	2	6.1	3	9.1	-	-	-	-
Rembau	6	7	70.0	-	-	2	20.0	-	-	1	10.0
Besut	6	45	87.6	-	-	2	4.1	1	2.0	3	6.1
Bandar Bahru	4	3	30.0	1	10.0	2	20.0	-	-	4	40.0
Jelebu	4,	2	50.0	-	-	1	25.0	1	25.0	-	-
Sik	3	3	60.0	-	-	1	20.0	-	-	1	20.0
Cameron Highlands	3	-	-	1	33.3	1	33.3	1	33.3	-	-
Ulu Trengganu	3	14	87.5	-	-	1	6.3	-	-	1	6.2
Marang	2	5	100	-	-	-	-	-	-	-	-
Bachok	2	12	100	-	-	-	-	-	-	-	-
Padang Terap	1	2	100	-	-	-	-	-	-	-	-

Key: (1) Elementary Resource-based industry
(2) Advanced Resource-based industry
(3) Consumer non-durable industry
(4) Intermediate industry
(5) Capital goods industry

Appendix Table A1.9. DISTRICT-LEVEL DISTRIBUTION OF MANUFACTURING ACTIVITY, 1968 (Number of Establishments)

	Rubber remilling latex processing	Rubber Smoke-houses	Coconut oil mills	Copra kilns	Tea factories	Coffee bean milling	Meat canning	Ice-cream & dairy products	Pineapple canning	Pickles,fruit & vegetable preserves	Bleaches	Fish canning & other preparations	Small rice mills	Rice flour mills	Sago & tapioca mills	Large rice & grain mills	Biscuit factories & bakeries	Sugar factories, refinery, cocoa, chocolate making	Nethoon related products	Edible oils & spice grinding plants	Coconut shredding & grinding	Soya bean products	Coffee factories	Ice factories	Animal feeds	Breweries & distilleries	Soft drinks & carbonated drinks	Tobacco products	Textile industry	Mfg. of footwear	Mfg. of glass, sandals, repairs	Clothing, textile goods	Sawmills	Plywood,particle board, planning mills	Firewood	Wood preservation & prefabrication	Rattan processing & products	Wooden boxes	Carpentry shops	Coffin mfg., wood & cork	Furniture & fixtures	Pulp, paper, paper products	Printing & publishing	Leather tanneries	Leather products	Rubber products	Chemical products	Perfumes, matches candles	Clay & clay products	Primary metal - iron & steel mills	Iron foundries basic metal products	Metal products	Machinery & Engineering	Electrical Equipment	Electrical repair	Ship building & boat building	Motor vehicles	Precision goods	Repair of precision goods	Brooms, brushes
Batu Pahat	9	3	9			1		2					3		11	4	4/10			8	3		2	5	1	1		2	3	3	4	4	9	b			1		6	3	18	2	14			35	8	1	3						
Johore Bahru	8	3					1		2	1			2			1	7/19	5	7	7	1	1	6	1	1	1	1		2	5	8	3	23	10				3		6	2	34		15	1	5	17	24	10	15		1	55	9	6	10	2	6	12	2	1
Kluang	4	1						1		1				1			2/12		1	6			1	1				1					7	6			1			2	6		5		1	4	2	1			25	7	2	8		1	1	2	
Kota Tinggi											1	1					1/6					1	1	1								3																								
Mersing													1				/2												1			1																							
Muar	3	2	7			1		1		3			8	1	6	1	8/13	2	10	4	2	8	5	1			4	4	2	3	1	2	9	1			5		5	6	9		4		1	6										
Pontian	2	1	3					2		1	1		1				2/4		1	2			2	1					1	2		4	1				1		1	3			1	1	42	7	2	5	1		1	1		
Seganat	1												2	1		1	/16	1		3			1					3	0	2	1		3		1		2		1		4			1	1	4	1			16	3	1	4					
Yen													13																								1														27	2		1		1			
Baling	1												14				/1										1	1				1	1																		2						
Bandar Bahru													3				/2					1																														2						
Kota Star	2							3		2			120		1	30	5/6	1	9	2			13	4				1			1	6	12	5			2	2	4	1	25	1	6			4					4				
Kuala Muda	3			1				1		1		1	32	1	1	3	4/7		5	3		7	2	1		1	1	10		1	3	2	8	2	1		2			4	10		4			4		2	7		2	30	11	1	7	1	1	2		
Kubang Pasu								1					72			6	/3		1													2								1					8	2		6			17	4	1	3		3		1	
Kulin	2							1		2			7		3		3/7		2	1			6			1	3		1			1	3				3		1	1	8		2			1					3					1		
Langkawi													5				1/1								1							1	1								1									15	3	1			1		
Padang Terap													4																																												
Sik													2								1																																1						
Bachok													11																			1																				1						
Kota Bahru	2	2	3					1		2			40			1	6/17		1	1	3		6	2			3	1	28	5	3	14	1							21		11			2	4	2			3	14	9	1	9			1	1	
Machang													7			1	/1															1								1											1							
Pasir Mas													1							1	1			1								4								4											1						
Pasir Putch													27				/1							1				1					1							2																
Tanah Merah													2				/1														1																										
Tumpat													8				1/3				2		2									1																									
Ulu Kelantan											1		1				/4											1				4																									
Alor Gajah	1	4											1		2	1	1/7		1									1		2	3	1							2																			
Jasin	1	2											3		2		/4						1								1	1	2																									1
Malacca Central	2	5	2					1		4			6	1	1	4	11/19	2	8	5	4	6		2		1	3	1		11	9	11	5	4			2		9	4	46	7	18			10	7		21			31	26	2	10	2	6	2	5	3
Jelebu													1					1	1													1																									
Kuala Pilah	2												19				/5		1	3								1		1	2		3		1				1	3		1			1					1						
Port Dickson		1						1									/2		2												1		1							3					4					16	1		4		1	1		
Rembau	2	2											1				/2																													3					5	1		3				1	
Seremban	4	13	1					1								3	2/20		7	5		4	1	1		1	1	1		3	2	5	16	6	1		1		4	4	22		6								1						
Tampin	1												3				1/4	1				1			1						1	1	4							2					11	1	2	14		1	42	17	5	10		4		2	
Bentong	2	10						1					4				/3		1			7						1		1	2		5		1		1	1	1	4		2			1			1		6			1			2	
Cameron Highlands																	/1											1			1																				12					1	
Jerantut													12				/2					1										6							2												2						
Kuantan	1		3					1		1		7	3			1	/6		4	1		4	3	1	1				1	2		1	14	2			1		1	5	14		5			2					1						
Lipis		1											10				/1				1	1	1			1						3																									
Pekan													9			1	/2				1	1		1								5																									
Raub		6											9				/4			1			1					1	1	2		8		1																							
Temeloh													50				1/1			2	2									2		9																								
Bukit Tertajan	3	1	7	1			2	1		7			20	1	3	10	6/1	1	4	2		1	5	1	4			3	4	2	3	1	11																									
Butterworth			5	1						4	2		18	1	4	14	2/4	1	1	5		2	12	1	4		4	3	2	7	1	6	10	4		2	4	1	4	3	14	5	4			3	10		7		1	18		5	3		1	1		
Nibong Tebal	1	1	1	2				1		2			4			4	10/2		3	2		4	3		1		1					2																									
Penang N.E.	3		2		1		2	5		35	7	2		2	1	1	17/21	1	56	11	2	33	21	8	8		4	9	3	23	12	19	13	5	2		8	10	18	3	55	21	73			7					1						
Penang S.W.											3		6			1	/1			1			1				1					1					1				2			1	6	13	40	7	22		15	97	37	9	10	6	9	6	7	2
Batang Padang		5										2	2		2		1/7		4	2		4		1				3		1		7					1				4					1										
Dindings	0	15	1										5		1		1/7		3	1			1	2	1		1	4				4							3		2	6	1	1			1	1				21	4	1	5			2	
																																																								1	
Kinta	2	1	5		1			6	26	4		1		5	20	7	20/27	10	30	10		19	15	5	1		3	19		33	11	17	38	9		1	3	3	19	8	50	7	39	1	1	34	40	4	80		14	110	97	11	19		13	19	7	3	
Krian								1					35				2/3		2	2	1	2	4	1									5				1				1				2		1			8				1	2		1	1
Kuala Kangsar	1							3		2			27		5	1	4/4	2	4	5		3	1					5		1		8	1			4	1	3	1	8		2			2	1		1		21	2	1	5				3	
Larut/Matang	3	1						5		4	1	2	9	1		1	4/16	1	10	4	2	4	11	3			2	4	3	6	1	1	13		1	2	1			5	1	7	4	5	1		7	5		10	1	1	18	5		4	2	2	1		
Lower Perak	1	1	2					2		2			14			3	6/4		4	4		1	10	1			2	10		1	1	1	7	1			5				22		6			2	3				1	17	6		7	1		1	5	
Upper Perak								1					8				/2				1							1													2																		
Perlis										3			46			4	1/3		3				1	2			2					2	1							2					4		1										
Klang	4		1			2		2	1	6						3	6/13	2	8	4		1	8	1	1			4	1	5	3	2	4	2	1					4	5	1	19	5	11			13	10		7		2	36	10	5	7	2	7	2	2	
Kuala Langat	1	3				16		2						1			1/4		4	1			3										1	1																								
Kuala Lumpur	7	9	5		1		4	9		28		1	1			9	25/42	8	45	10		7	18	3	9	4	16	12	10	17	16	45	57	24		3	3	18	27	12	149	31	142	6	3	50	72	14	92		34	230	147	28	36		25	48	12	3	9
Kuala Selangor	1	1	1				1	1					10			1	/5	1		1			1						1				1		1					1	1										15	3		5					
Sabak Bernam			1					1					11			1	1/1			1			1								1		11	1	1																						
Ulu Langat		1						2					2		1		/4	1	1	1		3	2							2			7	1																						
Ulu Selangor	1	13						1					1				/3		3	1													5	1																						
Besut													40											1									3																							
Dundun													4				/4																5																							
Kemaman								1				2	3				/2										1						4																							
Kuala Trengganu			2					2					85				2/8		1	1			1	1					1	2	1	2	9	1				2		9		3			4					14	4	2	9	1			1	2
Marang													4																				1																							
Ulu Trengganu													13				/1																																								

Source: Compiled from the Directory of Manufacturing Establishments, Department of Statistics, 1970.

Appendix Table A 3.10. CONTRIBUTION TO FULL-TIME PAID EMPLOYMENT IN MANUFACTURING BY ESTABLISHMENTS OF DIFFERENT EMPLOYMENT SIZE, 1968

District	Total Employment		% Contribution by Establishment with 1-19 F.T.P. Empl.	20-49 F.T.P. Empl.	50-99 F.T.P. Empl.	100+ F.T.P. Empl.
Kuala Lumpur	43,265	31.46	13.68	18.42	20.15	47.75
Kinta	13,132	9.55	21.51	21.07	22.12	35.31
Johore Bahru	12,680	9.22	9.01	10.71	11.75	68.52
Klang	7,634	5.55	10.40	5.24	7.81	76.55
Penang N.E.	7,287	5.30	28.38	17.23	17.39	36.99
Butterworth	4,757	3.46	21.56	19.18	7.84	41.02
Seremban	3,611	2.63	19.36	27.44	6.20	47.00
Kota Bahru	3,278	2.38	22.75	7.96	11.38	57.91
Bukit Mertajam	3,261	2.37	12.91	10.58	9.14	67.34
Larut/Matang	3,248	2.36	19.25	12.40	6.90	61.45
Malacca Central	2,707	1.97	36.02	23.45	5.50	35.02
Batu Pahat	2,569	1.87	22.34	18.41	14.52	44.72
Kota Star	2,411	1.75	38.12	37.17	24.72	-
Kluang	2,377	1.73	11.07	8.12	9.42	71.39
Kuala Muda	2,388	1.66	18.31	12.93	9.79	58.96
Kuantan	1,644	1.20	25.12	20.38	27.19	21.31
Pontian	1,631	1.19	10.12	10.30	9.14	70.45
Kuala Trengganu	1,377	1.00	13.51	12.20	16.27	58.03
Muar	1,276	0.93	38.95	20.06	17.53	23.43
Lower Perak	1,062	0.65	40.37	33.91	12.82	12.91
Ulu Selangor	1,032	0.75	13.95	11.05	7.27	67.73
Termeloh	950	0.69	7.79	16.11	39.26	36.84
Segamat	936	0.68	22.23	16.35	8.01	53.42
Dindings	934	0.68	17.24	5.35	23.96	53.53
Port Dickson	928	0.67	10.28	11.20	8.08	69.94
Kulim	800	0.58	21.63	13.01	28.00	37.38
Kuala Kangsar	710	0.52	38.17	12.53	-	49.30
Nibong Tebal	679	0.49	19.14	7.22	-	73.63
Bentong	669	0.49	14.94	21.53	11.21	52.32
Raub	637	0.46	15.69	13.97	23.39	46.94
Ulu Langat	561	0.41	20.15	27.27	39.93	26.74
Alor Gajah	531	0.39	15.26	4.71	14.12	65.91
Kuala Selangor	503	0.37	27.64	12.92	29.62	27.84
Krian	472	0.34	70.34	13.77	15.89	-
Mersing	441	0.32	11.12	38.09	50.79	-
Kuala Pilah	389	0.28	31.63	10.28	38.30	38.56
Jerantut	362	0.26	9.39	28.73	61.88	-
Kubang Pasu	350	0.25	33.71	66.28	-	-
Batang Padang	342	0.25	44.71	34.34	-	-
Perlis	326	0.24	55.82	44.17	-	-
Baling	296	0.22	9.12	40.20	-	50.68
Kuala Langat	273	0.20	27.10	17.95	-	54.95
Lipis	259	0.19	13.13	-	28.96	57.92
Kota Tinggi	248	0.18	33.88	35.89	30.24	-
Tampin	243	0.18	7.41	-	30.86	61.73
Kemaman	231	0.17	18.18	17.32	64.50	-
Dungun	209	0.15	9.57	19.14	71.29	-
Besut	178	0.13	50.00	50.00	-	-
Rembau	174	0.13	19.54	37.36	43.10	-
Sabak Bernam	164	0.12	39.02	15.24	45.73	-
Pasir Mas	164	0.12	36.59	63.41	-	-
Ulu Kelantan	126	0.09	20.64	19.84	59.54	-
Pekan	104	0.08	24.04	75.96	-	-
Jasin	89	0.06	55.06	44.94	-	-
Sik	80	0.06	6.25	93.75	-	-
Upper Perak	73	0.05	45.21	54.79	-	-
Pasir Puteh	67	0.05	100.0	-	-	-
Langkawi	64	0.05	23.44	76.56	-	-
Bachok	62	0.05	25.48	64.52	-	-
Tumpat	57	0.04	56.14	43.86	-	-
Penang S.W.	47	0.03	100.0	-	-	-
Ulu Trengganu	40	0.03	100.0	-	-	-
Jelebu	35	0.03	28.57	71.43	-	-
Yen	25	0.02	100.0	-	-	-
Marang	18	0.01	100.0	-	-	-
Machang	12	0.01	100.0	-	-	-
Tanah Merah	10	0.01	100.0	-	-	-
Bandar Bahru	10	0.01	100.0	-	-	-
Padang Terap	5		100.0	-	-	-
Cameron Highlands	3		100.0	-	-	-

F.T.P. Empl. = Full-time paid employment.

Appendix Table A6.1.

PARTICIPATION OF STATE DEVELOPMENT CORPORATIONS IN MANUFACTURING

Activity

1. SEDC Johore

Sand mine/silica factory (joint venture) 10,000 acres.

Oil palm estate, Muar (joint venture), 350 acres.

Oil palm estate, Kluang I (joint venture) 10,500 acres.

Oil palm estate, Kluang II 4,000 acres.

Stainless Steel Cutlery Industry (joint venture).

Steel Industry (joint venture).

Ice factory (joint venture)

Tapioca estate/factory ($3.6 million) 10,200 acres, including lumbering at the tapioca estate site.

Palm oil purification (joint venture)

Responsible for the development of all the industrial sites in the State.

2. SEDC Kedah

Sugar complex. Pahang Sanai (joint venture) $55 million.

Development of industrial sites in the State.

3. SEDC Kelantan

Lumbering (389,703 acres) Plywood/Veneer industry (joint venture)

Integrated Fisheries Complex (joint venture) $2 million

Padi Mill, Pasir Mas - $500,000

Oil palm/Tapioca projects.

Development of industrial sites in the State.

4. SEDC Malacca

Lumbering - Forest Reserve, Ramnan China - 2,464 acres.
Experimental study of prawns (location and fishing) in Malacca and Negri Sembilan waters.
Formation of "Sharikal Pelabohan Melaka Sdn. Bhd".
Development of industrial estates and free trade zones.

5. SEDC Negri Sembilan

Cane sugar Industry (joint venture) - Kuala Pilah 45,00 acres (first phase).
Passion-fruit processing industry 100 acres - Kuala Pilah $250,000.
Integrated Hatchery, Egg and Broiler Commercial Farm (joint venture) $2 million.
Edible oil - margarine manufacture (joint venture).
Rubber-Seed Oil Industry (joint venture) $2 million Senawang.
Tapioca plantation/processing Bahau.
Integrated Timber Complex, Rompin (first phase) $4 million.
Powdered Activated Carbons Industry, Kuala Pilah (joint venture) $3 million.
Development of all industrial sites in the State.

6. SEDC Pahang

Loans given by corporation to Bumiputras to invest in industries and business.
Between 1972 to 1975 - invested $1.9 million in industrial projects including lumbering and timber processing.
Another $951,000 for industrial investment has been approved.
Responsible for developing the industrial estates in the State.

7. SEDC Perak

Sugar Factory - Gula Perak $4,501,000.

Tapioca plantation/Processing - Grik 5,000 acres - $2.9 million.

Integrated Coconut Industry - Lower Perak - $6 million.

Limestone complex - $4 million.

Rubber gloves industry - $0.5 million.

Mining Activity - Chikus 9,300 acres, and Tanjong Tualang - 4,000 acres.

Responsible for the development of industrial estates in the State.

8. SEDC Perlis

Sugar Factory, Chuping.

Cement Factory, Chuping - 25% participation.

Prawn and Fish Canning Industry - Kuala Perlis (joint venture).

Responsible for the development of the free trade zone at Padang Besar.

9. SEDC Penang

Agricultural and Livestock Industry.

Mushroom Industry 23 acres - Bagan Serai.

Penang Electronics Sdn. Bhd. - Bayan Lepas FTZ.

Development of the industrial estates and free trade zones in the State.

10. SEDC Selangor

Development of Industrial Estates and Free Trade Zones in the State.

Investment in a few industrial projects on a joint venture basis - e.g. Jaya Jiwan Shah Alam.

Mining at Ulu Yam 600 acres.

11. SEDC Trengganu

Timber prospecting - Bukit Besi, Dungun and Ulu Trengganu.

Lumbering - Pesaka Trengganu Bhd. 48,339 acres.

Tapioca plantation/processing.

Maize plantation/processing.

Cashew nut plantation/processing.

Rubber Estates/Processing - Sungei Tong (5,601 acres) and Bukit Besi, Dungun (3000 acres).

Stevedoring and Coastal Shipping Corporation (joint venture with SEDC Pahang and SEDC Kelantan.

Responsible for the development of industrial sites in the State.

Note The industrial sites and free trade zones in the respective states are given in Table 4.5.

Appendix Table A7.1. VALUE ADDED IN PRODUCTION SECTORS AND GROSS DOMESTIC PRODUCT BY DISTRICTS OF WEST MALAYSIA

District	Production Sectors: Agriculture Forestry & Fishing	Mining & Quarrying	Manufacturing	Construction	Utilities	Transport, Storage, Communications	Wholesale & retail trade	Banking, Insurance & real estate	Ownership of Dwellings	Public Administration, defence, education & medical health	Other Services	Gross Domestic Product	Population 1970	Per Capita G.D.P.	G.D.P. per Capita as % of National Average
All districts in Johore	445500.0	25300.0	169300.0	18100.0	24900.0	47300.0	128400.0	13600.0	50700.0	146200.0	41600.0	1110900.0	1273990	872	-
Batu Pahat	88205.4	1866.0	27.8	2629.8	2140.3	8362.6	25231.5	1738.8	7657.1	21392.0	6947.8	166198.4	249869	665	69.8
Johore Bahru	64712.9	2850.5	107551.8	7124.4	12698.4	13958.8	33532.6	5584.3	13760.8	52825.4	6048.4	320648.4	271448	1181	123.9
Kluang	50873.9	160.3	28616.9	1852.9	2723.1	5350.9	11655.7	1147.2	5773.8	18322.3	2887.2	129364.1	133517	970	101.8
Kota Tinggi	27052.6	16015.7	1180.1	486.2	1051.0	1439.9	4097.0	1046.2	1836.4	4813.3	1544.7	60363.0	61406	983	103.1
Mersing	12325.6	2472.8	827.3	394.3	554.2	958.4	3831.1	165.9	1582.9	3617.3	758.5	27488.3	34620	794	83.3
Muar	102054.8	1534.0	10839.4	3317.6	3525.7	9879.7	26334.1	2417.0	9957.6	27091.7	5904.2	202855.9	279261	726	76.2
Pontian	47765.5	22.9	10464.5	927.9	840.8	3088.8	10270.9	288.6	3006.8	7747.9	14557.0	98981.6	117622	841	88.2
Segamat	52508.6	377.8	9792.2	1566.8	1366.3	4260.8	13447.1	1212.1	7124.6	10390.2	3152.3	104998.8	126447	830	87.1
All districts in Kedah/Perlis	389600.0	3800.0	45900.0	27800.0	6800.0	17700.0	41200.0	5700.0	37600.0	88600.0	13500.0	678000.0	1076436	630	-
Perlis	50547.1	1116.6	2381.8	2931.6	894.9	2277.6	5094.9	573.9	4248.9	10684.8	1869.3	82621.1	121062	682	71.6
Yan	20750.9	12.3	225.4	1341.5	188.8	549.6	1745.7	77.3	2404.8	2612.8	479.6	30388.7	55046	552	57.9
Kuala Muda	46177.7	314.6	1454.7	1283.6	298.4	852.2	3245.3	215.2	2885.8	4835.7	1710.7	63273.7	104307	607	63.7
Kulim/Bandar Bahru	11823.6	252.9	225.4	588.0	103.5	361.6	952.7	5.5	1107.6	2120.1	488.6	18029.5	33194	543	57.0
Kota Star	86438.7	339.3	13884.8	11676.4	2635.9	7097.0	14514.8	3305.2	11601.1	32054.3	3600.2	187047.7	302539	618	64.8
Kuala Muda	45915.4	1202.9	21279.5	4778.3	1095.1	3408.9	6479.4	750.0	6356.8	17579.9	2238.9	111091.7	159977	694	72.8
Kubang Pasu	55074.1	40.1	2642.4	985.4	413.9	928.6	3346.3	275.9	3426.0	5260.7	1286.8	73680.2	118587	621	65.2
Kulim	27062.7	348.5	2942.9	2708.0	785.4	1583.9	3610.4	364.2	3493.5	8317.1	947.4	52163.9	88447	590	61.9
Langkawi	11986.4	132.6	412.4	886.1	176.5	220.4	735.5	49.7	708.4	1737.2	186.5	17231.8	23856	722	75.8
Padang Terap	15026.1	-	255.4	364.4	91.3	152.8	458.5	66.2	624.8	1657.8	220.9	18918.0	30360	623	65.4
Sik	18797.3	40.1	225.4	256.7	115.6	267.4	1216.8	11.0	742.4	1739.5	271.4	25683.5	39061	603	63.3
All districts in Kelantan	127900.0	-	18100.0	14400.0	4100.0	16700.0	35100.0	3100.0	19500.0	50100.0	11400.0	300400.0		441	-
Bachok	11076.7	-	254.6	1616.4	166.6	1053.3	2566.9	119.7	1228.1	2787.5	503.8	21375.6	62119	344	36.1
Kota Bahru	22405.6	-	15185.0	6882.0	1993.5	7051.2	3968.6	1795.0	7872.7	24185.3	5574.7	106913.7	208076	514	53.9
Machang	12363.2	-	254.6	715.5	113.1	699.7	2360.4	114.0	1250.5	2640.0	617.4	21128.4	51637	409	42.9
Pasir Mas	21302.8	-	404.0	1313.6	660.5	2108.9	4270.8	199.5	2683.4	6524.1	909.1	40376.6	100734	401	42.1
Pasir Putih	14370.1	-	254.6	768.5	160.7	984.5	3135.0	114.0	1449.6	3313.4	1337.8	25888.1	70243	369	38.7
Tanah Merah	15543.1	-	892.3	495.9	136.9	827.4	2117.5	205.2	1079.1	3044.0	688.1	25029.5	57444	436	45.8
Tumpat	12409.8	-	207.4	1934.4	267.8	2280.8	4212.7	171.0	1918.7	4040.2	867.1	28509.8	73155	387	40.6
Ulu Kelantan	18428.7	-	647.5	673.8	601.0	1694.1	2468.1	381.8	2017.9	3565.6	902.0	31380.5	57218	548	57.5

District	Production Sectors: Agriculture Forestry & Fishing	Mining & Quarrying	Manufacturing	Construction	Utilities	Transport, Storage, Communications	Wholesale & retail trade	Banking, Insurance & real estate	Ownership of Dwellings	Public Administration, defence, education & medical health	Other Services	Gross Domestic Product	Population 1970	Per Capita G.D.P.	G.D.P. per Capita as % of National Average
All districts in Malacca	98100.0	200.0	19900.0	3600.0	8700.0	10400.0	16300.0	6100.0	14800.0	57700.0	24700.0	320500.0		794	-
Alor Gajah	38244.0	54.5	10234.1	841.9	1005.3	1710.3	12508.9	576.7	3400.4	12251.2	5129.3	85957.1	114603	750	78.7
Jasin	32995.5	123.9	205.8	313.9	750.1	963.2	8286.2	493.3	1990.5	6574.7	4896.0	57593.1	84858	679	71.2
Malacca Central	26859.9	21.6	9460.1	2444.2	6944.5	7726.4	55504.9	5030.0	9409.1	38874.2	14674.7	176949.6	204261	866	90.9
All districts in Negeri Sembilan	168900.0	2200.0	78600.0	20600.0	11600.0	21300.0	44800.0	7900.0	17800.0	67000.0	14500.0	455200.0		950	-
Jelebu	17285.8	1019.7	309.7	978.1	559.9	693.0	2449.2	188.0	1371.3	3129.3	459.5	28443.5	32905	864	90.7
Kuala Pilah	46580.9	89.6	962.8	3290.1	1267.8	3215.9	10419.4	1511.4	3549.0	10073.1	2900.6	83860.6	114794	730	76.6
Port Dickson	28647.5	407.1	60500.3	4238.6	4500.5	2507.9	5136.9	326.8	3814.8	20021.2	1520.6	131622.0	76187	1728	181.3
Seremban	39613.3	724.6	14238.6	9959.2	3908.9	9672.8	21886.9	4730.2	7229.0	25827.0	7148.8	144939.4	167913	863	90.6
Tampin	18979.1	37.4	2278.9	1541.3	1204.4	4562.1	2538.4	964.0	901.1	5132.9	1063.4	39202.9	47801	820	86.0
All districts in Pahang	187900.0	51900.0	37700.0	8600.0	5900.0	17000.0	36400.0	9400.0	21300.0	62200.0	11800.0	450100.0		895	-
Bentong	23310.9	1434.8	3286.5	1350.9	727.6	1661.1	3819.7	696.9	3437.5	7478.7	417.7	47622.3	56098	849	89.1
Cameron Highlands	5934.1	210.3	-	578.4	734.6	791.7	821.5	140.4	588.4	2368.3	254.4	12221.9	15852	771	80.9
Jerantut	15820.9	309.2	2852.6	341.9	105.8	626.6	1477.2	1273.4	1386.3	3251.4	797.7	28242.9	36856	766	80.4
Kuantan	17999.4	29475.0	12634.7	3412.1	1283.2	4896.0	9755.9	1298.5	2377.9	20125.4	2704.9	105963.1	96854	1094	114.8
Lipis	18013.1	742.1	697.9	381.7	403.5	1967.1	3102.8	927.5	2467.3	4583.5	1479.7	34766.2	50694	686	72.0
Pekan	34762.6	17724.7	2168.4	633.9	476.2	1938.0	5950.2	729.9	2717.4	6505.3	1701.8	75508.2	69355	1086	114.0
Raub	23537.6	1546.1	3841.6	929.4	1157.5	1938.0	3437.2	365.0	3662.7	5945.8	1498.9	47860.7	57394	834	87.5
Termeloh	48521.2	457.7	12218.4	1171.7	1011.9	3181.4	8055.8	3970.6	4662.7	11941.8	2944.9	98117.9	120028	817	85.7
All districts in Penang	135700.0	1000.0	107100.0	34300.0	25800.0	39300.0	209500.0	20600.0	38300.0	79200.0	67800.0	758600.0		977	-
Bukit Mertajam	24999.6	474.8	55805.7	4459.4	3770.8	6148.5	22002.2	948.8	5684.3	7117.8	7754.1	139165.0	117759	1182	124.0
Butterworth	48865.8	85.3	24435.7	5850.3	4646.3	5801.5	32264.5	1329.7	8322.9	11575.3	11085.9	154263.2	161605	955	100.2
Nibong Tebal	26028.7	15.7	6131.6	1125.5	1179.3	1208.2	9520.6	280.3	2258.5	3145.1	3124.8	54018.3	63646	849	89.1
Penang N.E.	12346.7	349.7	20336.8	21962.4	14662.8	24249.5	138698.7	17545.2	19031.4	53959.7	37575.7	360718.5	373086	967	101.5
Penang S.W.	23459.2	74.8	390.2	902.5	1540.8	1892.3	7014.0	495.9	3003.0	3402.2	8259.4	50434.4	60674	831	87.5
All districts in Perak	427300.0	284900.0	147000.0	29700.0	61400.0	44500.0	185200.0	24500.0	62700.0	163000.0	60000.0	1490200.0		954	-
Batang Padang	31448.3	36987.9	2373.2	1184.8	5899.7	3280.2	6851.4	1805.7	4932.8	9778.8	5223.8	109766.4	119590	918	96.3
Dindings	57661.5	1377.8	12755.2	1861.3	2086.5	2361.9	7611.5	1034.2	5684.1	10062.6	3915.5	106409.9	127885	832	87.5
Kinta	32605.9	215305.3	99936.0	16900.7	35585.2	18870.7	51367.5	14388.1	23790.1	74438.1	20714.8	603902.5	482567	1251	131.3
Krian	84983.3	119.4	2274.8	903.1	1194.3	2281.9	7599.2	656.6	4267.9	7535.8	5414.8	117229.1	153631	763	80.1
Kuala Kangsar	60591.1	5869.2	2631.4	1757.7	5626.3	3488.9	80931.6	1460.9	6489.4	16370.8	5573.5	190790.9	186261	1024	107.5
Larut/Matang	64032.7	13299.9	21917.0	3975.1	7324.3	6330.8	15141.4	2897.3	9116.6	24938.8	7977.6	176951.5	221061	800	83.9
Lower Perak	70788.3	6016.2	4182.7	2696.5	2474.9	5193.4	13183.0	2019.2	6114.6	15054.9	8975.8	136699.5	211168	647	67.9
Upper Perak	25189.1	5924.3	929.7	420.8	1208.7	2692.3	2514.5	238.0	2304.5	4822.1	2206.3	48450.4	60403	802	84.2

District	Production Sectors: Agriculture Forestry & Fishing	Mining & Quarrying	Manufacturing	Construction	Utilities	Transport, Storage, Communications	Wholesale & retail trade	Banking, Insurance & real estate	Ownership of Dwellings	Public Administration, defence, education & medical health	Other Services	Gross Domestic Product	Population 1970	Per Capita G.D.P.	G.D.P. per Capita as % of National Average
All districts in Selangor	361900.0	146100.0	618300.0	128900.0	82000.0	122500.0	437100.0	90700.0	77800.0	376700.0	141500.0	2583500.0		1586	-
Klang	50990.5	6766.8	85158.6	12494.8	13918.6	37332.7	56035.2	8083.7	12839.2	33377.4	22611.9	339609.5	232863	1458	153.0
Kuala Langat	55682.4	1519.4	895.3	2337.5	906.8	2623.5	11928.8	372.5	3694.7	9533.9	9381.8	98872.7	107212	922	96.7
Kuala Lumpur	38814.8	74907.7	504298.4	103826.1	59134.9	74177.1	320040.6	77419.6	43908.4	293588.9	72540.9	1662657.3	875722	1898	199.2
Kuala Selangor	91123.4	14197.7	7190.5	1476.0	785.8	1849.6	14545.0	484.3	4032.5	9359.8	11272.1	156316.7	135388	1155	121.2
Sabak Bernam	49939.3	38.3	636.2	1891.7	952.0	766.0	11540.4	344.6	2499.1	6593.9	5749.7	80951.1	77956	1038	108.9
Ulu Langat	34074.2	15116.8	3646.3	4536.4	3082.9	2960.9	11526.3	1266.6	4995.5	11983.1	11418.5	104607.4	96338	1086	114.0
Ulu Selangor	41275.5	33553.3	16474.7	2337.5	3218.9	2790.2	11483.7	2728.7	5830.7	12262.9	8525.1	140481.2	103857	1353	142.0
All districts in Trengganu	86300.0	32700.0	12300.0	3600.0	1700.0	10800.0	17000.0	2000.0	19200.0	35300.0	5500.0	226400.0		558	-
Besut	21419.3	268.3	1762.3	443.9	151.7	1406.3	2700.8	207.4	2824.8	5055.4	743.0	36983.3	79228	467	49.0
Dungun	9147.6	24668.8	3490.3	521.4	282.5	1897.5	2498.6	303.2	2680.1	5020.7	837.4	51348.2	54352	945	99.2
Kemaman	12034.9	5434.0	1726.5	216.2	245.8	868.3	2086.6	170.2	2553.2	3717.7	544.5	29598.0	44916	659	69.2
Kuala Trengganu	25113.1	1964.7	4816.5	2197.9	936.3	6212.8	8193.7	1180.8	9595.9	18971.5	2960.8	82144.1	173907	472	49.5
Marang	5357.7	76.7	252.2	128.5	10.5	178.3	711.3	22.3	637.5	931.7	79.4	8386.2	19684	426	44.7
Ulu Trengganu	13227.4	287.5	252.2	92.0	73.2	236.8	809.0	117.0	908.5	1602.9	334.8	17941.3	33664	533	55.9
All Seventy Districts	2428000.0	548000.0	1254000.0	290000.0	233000.0	348000.0	1211000.0	184000.0	360000.0	1126000.0	392000.0	8374000.0	8791636	953	100.0

Note: State figures are provided by Economic Planning Unit, West Malaysia.

Appendix Table A 7.2. SPATIAL INEQUALITY IN INCOME

(a) District-Level Inequality

District	Per Capita G.D.P.	$y_1-\bar{y}$	$(y_1-\bar{y})^2$	fi/n	$(y_1-\bar{y})\frac{fi}{n}$	$\sqrt{\sum_i \frac{(y_1-\bar{y})^2 \frac{fi}{n}}{\bar{y}}}$
Batu Pahat	665	-288	82944	.028	2322.4	
Johore Bahru	1181	+288	82944	.031	2571.3	
Kluang	970	17	289	.015	4.3	
K. Tinggi	983	30	900	.007	6.3	
Mersing	794	159	25281	.004	101.1	
Muar	726	-227	51529	.032	1648.9	
Pontian	841	-112	12544	.013	163.1	
Segamat	830	-123	15129	.014	211.8	
Perlis	682	-271	73441	.014	1028.2	
Yen	552	-401	160801	.006	964.8	
Baling	607	-346	119716	.012	1436.6	
Bandar Bahru	543	-410	168100	.004	672.4	
Kota Star	618	-335	112225	.034	3815.7	
Kuala Muda	694	-259	67081	.018	1207.5	
Kubang Pasu	621	-332	110224	.013	1432.9	
Kulim	590	-363	131769	.010	1317.7	
Langkawi	722	-231	53361	.003	160.1	
Padang Terap	623	-330	108900	.003	326.7	
Sik	6063	-350	122500	.004	490.0	
Bachok	344	-609	370881	.007	2596.2	
Kota Bahru	514	-439	192721	.024	4625.3	
Machang	409	-544	295936	.006	1775.6	
Pasir Mas	401	-552	304704	.011	3351.7	
Pasir Puteh	369	-584	341056	.008	2728.4	
Tanah Merah	436	-517	267289	.007	1871.0	
Tumpat	387	-566	320356	.008	2562.8	
Ulu Kelantan	548	-405	164025	.007	1148.2	
Alor Gajah	750	-203	41209	.013	535.7	
Jasin	679	-274	75076	.010	750.8	
Malacca Central	866	-104	10816	.023	248.8	
Jelebu	864	-89	7921	.004	31.7	
Kuala Pilah	730	-223	49729	.013	646.5	
Port Dickson	1728	+775	600625	.009	5405.6	
Rembau	686	-267	71289	.005	356.4	
Seremban	863	-90	8100	.020	162.0	
Tampin	820	-133	17689	.005	88.4	
Bentong	849	-104	10816	.006	64.9	
Cameron Highlands	771	-182	33124	.002	66.2	
Jerantut	766	-187	34969	.004	139.9	
Kuantan	1094	+141	19881	.011	218.7	
Lipis	686	-267	71289	.006	427.7	
Pekan	1086	+133	17689	.008	141.5	
Raub	834	-119	14161	.007	99.1	

(a) District-Level Inequality

District	Per Capita G.D.P.	$y_1-\bar{y}$	$(y_1-\bar{y})^2$	fi/n	$(y_1-\bar{y})\frac{fi}{n}$	$\sqrt{\sum_i (y_1-\bar{y})^2 \frac{fi}{n}}{\bar{y}}$
Termeloh	817	-136	18496	.014	258.9	
Bukit Mertajam	1182	+229	52441	.013	681.7	
Butterworth	955	+2	4	.018	0.1	
Nibong Tebal	849	-104	10816	.007	75.7	
Penang N.E.	967	+14	196	.042	8.2	
Penang S.W.	831	-122	14884	.007	104.2	
Batang Padang	918	-35	1225	.014	17.2	
Dindings	832	-121	14641	.015	219.6	
Kinta	1251	+298	88804	.055	4884.2	
Krian	763	-190	36100	.017	613.7	
Kuala Kangsar	1024	*71	5041	.021	105.9	
Larut/Matang	800	-153	23409	.025	585.2	$\sqrt{\frac{167078.6}{953}}$
Lower Perak	647	-306	93636	.024	2247.3	
Upper Perak	802	-151	22801	.007	159.6	
Klang	1458	+505	255025	.026	6630.7	
Kuala Langat	922	-31	961	.012	20.2	$\frac{408.75}{953} = 0.43$
Kuala Lumpur	1898	945	893025	.100	89302.5	
Kuala Selangor	1155	202	40804	.015	612.5	
Sabak Bernam	1038	85	7225	.009	65.0	Vw = 0.43
Ulu Langat	1086	133	17689	.011	194.6	
Ulu Selangor	1353	400	160000	.012	1920.0	
Besut	467	-486	236196	.009	2125.8	
Dungun	945	-8	64	.006	0.4	
Kemaman	659	-294	86436	.005	432.2	
Kuala Trengganu	472	-481	231361	.020	4627.2	
Marang	426	-527	277729	.002	555.5	
Ulu Trengganu	533	-420	176400	.004	705.6	
National Average	953					

(b) State-Level Inequality

States						
Johore	872	-81	6561	.14	918.5	
Kedah/Perlis	630	-323	104329	.12	12519.5	
Kelantan	441	-512	262144	.08	20971.5	
Malacca	794	-159	25281	.05	1264.1	
N. Sembilan	950	-3	9	.05	0.5	
Pahang	895	-58	3364	.06	201.8	
Penang	977	+24	576	.09	51.8	
Perak	954	+1	1	.18	0.2	$\sqrt{\frac{11986.1}{953}} = 0.36$
Selangor	1586	+633	400689	.19	76130.9	
Trengganu	558	395	156025	.05	7801.3	Vw = 0.36
National Average	953					

Appendix Table A7.3. SPATIAL URBAN AND ECONOMIC DISPARITIES, WEST MALAYSIA, 1970

District	Urban Pop. as % of District Pop.	% of Urban Pop. 1957	% change in Urban Pop. 1957 1970	Urban Pop. as % of State Urban Pop.	Man-land Ratio	Sq. mls. of Territory served by 1 mile of Road
Batu Pahat	21.3	20.3	33.3	15.9	0.85	3.27
Johore Bahru	54.5	47.4	97.2	44.1	1.09	2.23
Kluang	32.5	33.9	38.8*	12.9	0.63	7.73
K. Tinggi	-	-	-	-	0.79	12.56
Mersing	-	-	-	-	1.62	9.42
Muar	26.3	17.7	88.0	21.9	0.84	2.47
Pontian	-	-	-	-	0.78	3.70
Segamat	14.1	19.7	-3.9*	5.3	0.60	5.83
Yen	-	-	-	-	1.17	1.84
Baling	-	-	-	-	0.85	5.99
B. Bahru	-	-	-	-	0.73	2.79
Kota Star	21.9	23.8	25.3**	55.1	1.42	2.05
Kuala Muda	22.2	18.9	55.0	29.5	1.10	1.91
Kubang Pasu	-	-	-	-	0.93	2.90
Kulim	20.9	24.3	5.1*	15.4	0.81	2.66
Langkawi	-	-	-	-	1.32	8.41
Padang Terap	-	-	-	-	1.02	8.41
Sik	-	-	-	-	1.17	7.15
Bachok	-	-	-	-	1.43	2.25
Kota Bahru	39.1	32.9	65.1	78.8	2.37	1.22
Machang	-	-	-	-	0.93	4.61
Pasir Mas	11.2	-	-	10.9	1.10	3.83
Pasir Puteh	-	-	-	-	1.17	2.87
Tanah Merah	-	-	-	-	0.84	7.03
Tumpat	14.6	-	-	10.3	1.97	1.92
Ulu Kelantan	-	-	-	-	0.68	99.99
Alor Gajah	-	-	-	-	0.82	1.51
Jasin	-	-	-	-	0.71	1.32
Malacca Central	49.7	46.5	45.2	100.0	3.45	0.81
Jelebu	-	-	-	-	0.71	4.98
Kuala Pilah	10.9	12.5	4.2*	12.1	0.66	4.29
Port Dickson	13.5	-	-	9.9	0.73	1.80
Rembau	-	-	-	-	0.68	2.17
Seremban	48.2	40.2	55.6	78.0	1.23	1.66
Tampin	-	-	-	-	0.69	2.44
Bentong	40.4	-	-	23.7	0.60	3.28
Cameron Highlands	-	-	-	-	1.90	6.40
Jerantut	-	-	-	-	0.68	16.88
Kuantan	44.8	44.3	87.9	45.3	2.12	4.52
Lipis	-	-	-	-	0.53	28.56
Pekan	-	-	-	-	1.31	20.26
Raub	32.1	40.8	19.5*	19.2	0.66	6.28
Termeloh	9.4	16.9	40.7*	11.8	0.60	5.27
Bukit Mertajam	22.6	32.8	7.7**	6.7	2.53	0.97
Butterworth	37.9	28.4	44.0**	15.5	2.92	0.83
Nibong Tebal	-	-	-	-	1.41	1.00
Penang N.E.	76.8	88.2	19.4**	77.8	22.87	0.62
Penang S.W.	-	-	-	-	2.15	1.28
Batang Padang	-	-	-	-	0.93	4.66
Dindings	-	-	-	-	1.09	2.33
Kinta	62.7	54.6	42.2	44.2	4.55	2.29
Krian	-	-	-	-	1.23	2.21
Kuala Kangsar	19.5	20.2	19.9*	14.1	1.03	7.84
Larut/Matang	29.6	27.6	35.5	24.8	1.66	3.78
Lower Perak	2.1	21.3	20.3	16.9	0.98	5.50
Upper Perak	-	-	-	-	0.99	8.67
Perlis	-	-	-	-	1.16	1.84
Klang	48.8	50.4	50.3	15.5	1.82	1.80
Kuala Langat	-	-	-	-	0.87	1.68
Kuala Lumpur	68.2	75.3	66.2	81.5	9.79	1.48
Kuala Selangor	-	-	-	-	0.95	3.54
Sabak Bernam	-	-	-	-	0.95	5.03
Ulu Langat	22.8	-	-	3.0	0.79	2.96
Ulu Selangor	-	-	-	-	0.79	4.55
Besut	-	-	-	-	1.05	6.16
Dungun	32.3	40.7	40.8*	16.0	2.38	10.96
Kemaman	27.9	33.4	14.7*	11.4	0.96	8.36
Kuala Trengganu	45.8	23.6	170.1	72.5	2.13	2.96
Marang	-	-	-	-	1.46	6.67
Ulu Trengganu	-	-	-	-	0.87	22.52

* Districts which recorded a higher percentage change in total population than a change in urban population between 1957 and 1970.

** Districts with medium and large towns indicating a higher percentage of total population increase compared with their urban population increase.

1. Man-Land Ratio is defined as population per acreage of alienated agricultural land, urban and estate settlement land.
Urban population is defined as population in centres of 10,000 and above.

13

BIBLIOGRAPHY

Alexander, J.W., "Location of Manufacturing: Methods of Measurement", Annals of the Association of American Geographers, vol. 48, (1958), 20-26.

Alexandersson, G., Geography of Manufacturing, Prentice-Hall, Englewood Cliffs, New Jersey, 1967.

Bela Balassa, "Growth Strategies in Semi-Industrial Countries", Quarterly Journal of Economics, Vol. 84, No. 1, (Feb. 1970), 24-46.

Bendavid, Avon, Regional Economic Analysis for Practitioners, Praeger Publishers, Praeger Special Studies in International Economics and Development, New York, 1973.

Berry, B.J.L., Essays on Commodity Flow and the Spatial Structure of the Indian Economy, Occasional Paper, Department of Geography, University of Chicago, 1966.

Britton, J.H.N., Regional Analysis and Economic Geography: A case study of Manufacturing in Bristol Region, G. Bells and Sons Ltd., London, 1967.

Chenery, H.B. and Taylor, L., "Development Patterns: Among Countries and Over Time", Review of Economics and Statistics, Vol. 50, No. 4, Nov. 1968.

Cheng Ban Lian, "Central Place Perspectives in a Transitional Agricultural Region: The case of Kedah Perlis", An unpublished M.A. thesis, Universiti Sains Malaysia, Malaysia, 1975.

Chisholm, M. and Manners, G., (Eds.), Spatial Policy Problems of the British Economy, Cambridge University Press, 1971.

Clark, C., Wilson, F. and Bradley, J., "Industrial Location and Economic Potential in Western Europe", Regional Studies, Vol. 3 (1969), 197-212.

Clark, P.B., Planning Import Substitution, North-Holland Publishing Company, Amsterdam, 1970.

Coley, W. and Lohnes, R., Multivariate Data Analysis, John Wiley and Sons, Incorp., New York, 1971, 168-187.

Committee on Economic Development, "Economic Development Issues: Greece, Israel, Taiwan and Thailand", Supplementary Paper No. 25, Praeger Special Studies in International Economics and Development, 1968.

Conkling, E.C., "South Wales, A Case Study of Industrial Diversification", Economic Geography, vol. 39 (1963), p. 258-272.

Cukor, Gyorgy, Strategies of Industrialization in the Developing Countries, C. Hurst and Co. Publishers Ltd., London, 1974.

Darwent, D.F., "Growth Poles and Growth Centres in Regional Planning - A Review", Environment and Planning, vol. 1 (1969) 5-31.

Dienes, L., "Locational Factors and Locational Developments in the Soviet Chemical Industry", Department of Geography, Research Paper No. 119, University of Chicago, 1969.

15 Dixon-Fyle, S.R., "Economic Inducement to Private Foreign Investment in Africa", The Journal of Development Studies, Vol. 4, No. 1 (Oct. 1967), 109-137.

Federation of Malaya, First Five-Year Plan, 1956-1960, Government Printers, Kuala Lumpur, 1957.

Federation of Malaya, Report of the Industrial Development Working Party, Government Printers, Kuala Lumpur, 1957.

Federation of Malaya, Pioneer Status Ordinance 1958, Government Printers, Kuala Lumpur, 1959.

Federation of Malaya, Population Census, 1957.

Friedmann, J., Regional Development Policy: A Case Study of Venezuela, M.I.T. Press, Cambridge, Mass., 1966.

Friedmann, J. and W. Alonso, (Eds.), Regional Development and Planning: A Reader, M.I.T. Press, Cambridge, Mass., 1964.

Greenhut, M., Plant Location in Theory and in Practice, University of North Carolina Press, Chapel Hill, 1956.

Haggett, P., Locational Analysis in Human Geography, Edward Arnold Publishers Ltd., London, 1965.

Haggett, P. and R. Chorley, Network Analysis in Geography, Edward Arnold Publishers Ltd., London, 1969.

Hamilton, F.E.I., "Models of Industrial Location", Chorley, R.J. and P. Haggett (Eds.), Socio-Economic Models of Geography, Part I and III, University Paperbacks, Methuen, London, 1968, 361-424.

Harris, C.D., "The Market as a Factor in the Localization of industry in the United States", Annals of the Association of American Geographers, Vol. 44 (1954), 315-348.

Hartshorne, R., The Nature of Geography, Lancaster, 1939.

Helleiner, G.K., "Export Earnings within the multi-national Company Framework", Far East Trade and Development (Aug. 1972), 295-297.

Helleiner, G.K., "Manufacturing Exports from Less-Developed Countries and Multinational Firms", The Economic Journal, Vol. 83 (March 1973) 21-47.

Hermen, T., "Cultural Factors in the Location of the Swatow Lace and Needlework Industry", Annals of the Association of American Geographers, vol. 46 (1956), 122-128.

Hirschman, A.O.,"The Political Economy of Import-Substituting Industrialization in Latin America", The Quarterly Journal of Economics, Vol. 82, No. 1 (Feb. 1968), 1-27.

Hirschman, A.O., The Strategy of Economic Development, Yale University Press, 1959.

Hirschman, C., "Ownership and Control in the Manufacturing Sector of West Malaysia", U.M.B.C. Economic Review, Vol. VII, No. 1 (1971), 21-30.

Hisao Nishioka and G. Krumme, Location Conditions, Factors and Decisions: An Evaluation of Selected Location Surveys, Land Economics, Vol. 49, No. 2 (May 1973), 195-205.

Hoover, E.M., Location Theory and the Shoe and Leather Industries, Harvard University Press, Cambridge, 1937.

Hoover, E.M., The Location of Economic Activity, Mcgraw-Hill Economics Handbook Series, New York, 1963.

International Bank for Reconstruction and Development, Report on Economic Development of Malaya, John Hopkin Press, Baltimore, 1955.

Isard, W., Location and Space-Economy, M.I.T. Press, Cambridge, Mass., 1956.

Isard, W., Methods in Regional Analysis, M.I.T. Press, Cambridge, Mass., 1960.

Kanapathy, V., Foreign Investment in Malaysia: Experience and Prospects, Occasional Paper 6, Institute of Business Studies, University Education Press, Singapore.

Keeble, D.E., "Employment Mobility in Britain", in Chisholm, M. and G. Manners (Eds.), Spatial Problems of the British Economy, Cambridge University Press (1971), 24-66.

Keeble, D.E., "Locational Migration from N.W. London, 1940-64" in Regional Analysis and Development, Open University Press, London, 1973.

Khoo Yokekuan, "The East-West Highway Project: An Analysis of the Potential Impacts of Transportation Investments on Regional Development", An unpublished M.A. Thesis, Universiti Sains Malaysia, Malaysia, 1975.

Lim, D., Economic Growth and Development in West Malaysia 1947-1970, Oxford University Press, 1973.

Lim Lin Lean, Some Aspects of Income Differentials in West Malaysia, Monograph Series in Malaysian Economic Affairs, University of Malaya, Malaysia, 1971.

Lo Sum Yee, The Development Performance of West Malaysia, Heinemann Educational Books (Asia) Ltd., Singapore, 1972.

Maizels, A., Growth and Trade, NIESR, Cambridge University Press, 1970.

Malaysia, Department of Statistics, Census of Manufacturing Industries, West Malaysia, 1963, 1968.

Malaysia, Department of Statistics, Survey of Manufacturing Industry West Malaysia, 1969, 1970, 1971.

Malaysia, Department of Statistics, Directory of Manufacturing Establishments in West Malaysia, Vol. I, II and III, 1970.

Malaysia, Department of Statistics, Sample Survey of Employment, Unemployment, West Malaysia, 1962.

Malaysia, Department of Statistics, Malaysian Socio-Economic Sample Survey of Households, 1967/68.

Malaysia, Department of Statistics, Population Census, 1970.

Malaysia, Department of Statistics, National Accounts of West Malaysia 1957-1968.

19 Malaysia, Department of Statistics, Census of Wholesale and Retail Trade in Urban Areas of West Malaysia, 1970.

Malaysia, Department of Statistics, Housing Census, 1970.

Malaysia, Bank Negara, Monthly Statistical Supplement, August 1975.

Malaysia, First Malaysia Plan 1965-1970, Government Printers, Kuala Lumpur, 1965.

Malaysia, Second Malaysia Plan 1971-1975, Government Press, Kuala Lumpur, 1971.

Malaysia, Mid-Term Review of the Second Malaysia Plan, Government Press, Kuala Lumpur, 1973.

Malaysia, Federal Industrial Development Authority, "Malaysia: A New Industrial Development Strategy", July 1969.

Malaysia, Federal Industrial Development Authority, "All About Investment Incentives", 1973.

Malaysia, Federal Industrial Development Authority, Annual Report 1973, March 1974.

Malaysia, Federal Industrial Development Authority, Malaysian Industrial Digest, Vol. 7, No. 3, 1974.

Malaysia, Pahang Tenggara Regional Masterplanning Study: Settlements and Infrastructure, Foundation of Canada Engineering Corp., et al. (FENCO), Submitted to the Govt. of Malaysia and the State of Pahang, Kuala Lumpur, 1972.

20 Manners, G., D. Keeble, B. Rodgers, K. Warren, Regional Development In Britain, John Wiley and Sons, London, 1972.

Mather, P.M., "Varimax and Generality", Area, Institute of British Geographers, Vol. 3, No. 4 (1971), 253-255.

Mcmillan, T.E. (Jr.), "Why Manufacturers Choose Locations vs. Determinants of Plant Location", Land Economics, Vol. 41 (1965), 239-246.

Mctaggart, W.D., Industrialization in West Malaysia 1968, Occasional Paper No. 2, Centre for Asian Studies, Arizona State University, 1972.

Monsen, K.J. and J.S. Chiu, D.E. Cooley, "The Effects of Separation of Ownership and Control on the Performance of the large Firm", Quarterly Journal of Economics, Vol. 3 (1968).

Myrdal, G., Economic Theory and Underdeveloped Regions, Gerald Duckworth and Co. Ltd., London, 1957.

Nelson, J. and L. Tweeten, "Systems Planning of Economic Development in Eastern Oklahoma", American Journal of Agricultural Economics, Vol. 57, No. 3, (1975).

Nie, N.H., C.H. Hull, J.G. Jenkins, K. Steinbrenner and D.H. Bent, Statistical Package for the Social Sciences, McGraw-Hill Inc., New York, Second Edition, 1975.

Norris, J.M., "Functional Relationships in the Interpretation of Principal Components Analysis", Area, Institute of British Geographers, Vol. 3, No. 4 (1971), 217-220.

O'Callaghan, J.J., Town Sizes and Thresholds for Manufacturing Activities in West Malaysia, Working Paper No. 39, Pahang Tenggara Master Planning Study, July 1971 (mimeo).

Ooi Jin Bee, Land, People and Economy in Malaya, Longmans, 1963.

Paauw, D.S. and C.H. Fei, The Transition in Open Dualistic Economies: Theory and South East Asian Experience, Yale University Press, New Haven, 1973.

Parry, T.G., "The International Firm and National Economic Policy: A Survey of Some Issues", The Economic Journal, Vol. 83 (Dec. 1913), 1201-1220.

Perroux, F., "Economic Space, Theory and Application", Quarterly Journal of Economics, Vol. 64, (1950), 84-104.

Pred, A., "Towards a Typology of Manufacturing Flows", The Geographical Review, vol. 54, No. 1 (1964) 65-78.

Pred, A., Behaviour and Location, Foundations for a Geographical and Dynamic Location, Part I, Lund Series in Geography, Series 27B, Sweden, 1967.

Rees, J., "The Industrial Corporation and Location Decision Analysis", Area, Institute of British Geographers, Vol. 4, No. 3 (1972), 199-205.

Ridzuan bin Akil, "Growth, Structural Change and Employment Creation in the Malayan Manufacturing Industries since Independence", An unpublished Ph.D. Thesis, University of Hull, 1972.

Robson, B.T., Urban Analysis: A Study of City Structure, Cambridge University Press, 1969.

Rodgers, A., "Changing Locational Patterns in the Soviet Pulp and Paper Industry", Annals of the Association of American Geographers, Vol. 45 (1955), 85-104.

Rummel, R.J., Applied Factor Analysis, Northwest University Press, 1970.

Silcock, T.H. and E.M. Fisk, (Eds.), The Political Economy of Independent Malaya: A Case Study in Development, Angus and Robertson Ltd., London, 1963.

Simonsen, O.C., Population Distribution and Growth Patterns, Part I, Urbanization in Peninsula Malaysia, Special Projects, Economic Planning Unit, Kuala Lumpur, Nov. 1973.

Simonsen, O.C., Land Use and Density Factors, Part III, Urbanization in Peninsula Malaysia, Special Projects, Economic Planning Unit, Kuala Lumpur, Nov. 1973.

Simonsen, O.C., Indicative Urban and Non-Urban Income Disparities in Peninsula Malaysia and its Implications for Development, Economic Planning Unit, Kuala Lumpur, July 1975 (Draft).

23 Smith, D.M., Industrial Location: An Economic Geographical Analysis, John Wiley and Sons, New York, 1971.

Thompson, J.H., "Manufacturing in the Kita Kyushu Industrial Zone of Japan", Annals of the Association of American Geographers, Vol. 49 (1959), 420-442.

Thompson, J.H., "A New Method for Measuring Manufacturing", Annals of the Association of American Geographers, Vol. 45 (1955), 416-436.

Ullman, E.L., American Commodity Flow, University of Washington Press, Seattle, 1957.

United Nations Development Programme, Food and Agriculture Organization (FAO) and FIDA, An Industrial Potentialities Study of the States of Kelantan and Trengganu, Malaysia, 3 Parts: Part I: Industries Other than Agro-based, Wood-based; II: Agro-based, Allied and Food Processing Industries; III: Wood-based Industries, Kuala Lumpur, 1972 (mimeo).

Walker, D.F., "Government Influence on Manufacturing Location: Canadian Experience with Special Reference to the Atlantic Provices" Regional Studies, Vol. 9 (1975), 203-217.

Webber, M.J., Impact of Uncertainty on Location, The M.I.T. Press, Cambridge, Mass., 1972.

Wojciech Morawski, Balances of interregional commodity Flows in Poland: A Value Approach, Regional Science Association, Vol. 20, Hague Congress, 1957. Reprinted in,

Blunder, J., Brook, C., Edge, G. and A. Hay, Regional Analysis in Development, The Open University Press, 1973.

Wood, P.A., "Industrial Location and Linkage", Area, Institute of British Geographers, Vol. 1, No. 2, (1969), 32-39.

Yeates, M., An Introduction to Quantitative Analysis in Economic Geography, McGraw-Hill Book Company, New York, 1968.